

# CANADIAN PUBLIC HEALTH JOURNAL

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REPORT OF THE ASSOCIATION'S WORK DURING 1937

(Part I)

PUBLISHED MONTHLY BY THE  
Canadian Public Health Association

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# CANADIAN PUBLIC HEALTH JOURNAL

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## Public Health Progress

### Presidential Address\*

P. S. CAMPBELL, M.D.

*Chief Health Officer, Province of Nova Scotia, and  
President of the Canadian Public Health Association*

IT is with considerable temerity that I present before this audience of Canadian public health workers this presidential address. When I consider the long line of courageous and worthy men who have preceded me in the presidency, I am most forcibly reminded of my unworthiness. Fully aware of the honour that has been accorded me, I wish publicly to thank those who are responsible for placing me here and to express the hope that anything that may fall to my lot to do to further the objectives of this organization, may be done in the same spirit of service that actuated those who have gone before me.

As President of the Canadian Public Health Association and as Chief Health Officer of this Province, I bid you one and all a hearty welcome to the City of Halifax and to the Province of Nova Scotia. I trust your sojourn with us will be one of pleasure and profit. We have endeavoured, and I hope in a measure succeeded, to provide for your comfort and diversion. In preparing for this important public health and medical week, the most gratifying feature has been the unanimity with which all those who were requested, gave, without reserve, their co-operation. The meetings of the Committee on Arrangements have been attended by representatives of the Department of Pensions and National Health, the Canadian Public Health Association, the Provincial Association of Medical Health Officers, and Boards of Health, some of whom travelled many miles to be present. I have every confidence that the enthusiasm so evident from the start will pervade this meeting and that this spirit of co-operation will continue, invigorating our organization long after the close of this convention.

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\*Presented at the twenty-seventh annual meeting of the Association, Halifax, June 21, 1938.

In preparing the program every reasonable endeavour was made to assign to each body represented, sufficient time for the discussion of subjects peculiarly its own and to avoid, in so far as it was possible, repetitions or duplications. The variety of subjects and the excellent quality of the papers presented, as well as the facilities afforded for exchange of ideas, will, it is hoped, ensure that this conference will occupy more than a passing place in the chronicles of Canadian public health.

Public health has passed through numerous stages in its development. Years ago it was concerned almost entirely with matters of elementary sanitation when most of the work was done under the guidance of officials who might be termed sanitary inspectors. Then followed a period when special attention was given to isolation, quarantine and other activities tending to restrict the spread of communicable diseases. Educational propaganda was soon found necessary and after mature study specialized departments were organized and laws and regulations drafted governing the control of drinking water, sewage, preventable diseases, milk and other foods, drugs, laboratories, hospitals, and public charities generally. In addition, special sections were established for recording, tabulating and studying vital statistics. While it is still necessary to give particular attention to all the activities noted, to-day perhaps the most important work in any health department is that of education. All health officials are to a large extent concerned with teaching people how to keep well.

The promotion of the public health is now recognized as an essential function of government and is gradually being accorded similar recognition to commerce, finance, defence, and other important activities. This is as it should be, since any nation cannot prosper unless the health of its people is not only preserved but is developed to the greatest extent possible. As to whether public health, *per se*, is a federal or a provincial obligation need not be debated here. One might argue indefinitely and in the end arrive nowhere. Without doubt, some of the health problems of Canada are common to all the Provinces, while others are the concern of individual Provinces. Many of the common problems are being well handled by the Federal Government, through its effective Department of Pensions and National Health. If the Provinces attempted to deal with these problems also, a wastage of energy and money might result which at this time, or any other time, could not be justified. We are pleased to note in recent years a tendency on the part of the Federal Government to assume more of the burden. The Provinces are most appreciative of this. Special divisions have been established in the Department of Pensions and National Health, with trained personnel, for the purpose of studying health problems across Canada, the accumulated knowledge being made available to all the Provinces. Technical assistance is being provided for the investigation of special problems, and aid is available to meet public health emergencies. In order to maintain and extend those essential services for which they are now obligated, the Provinces require financial assistance from the Dominion Government. Such grants in aid would render more effective the health partnership between each Province and the Dominion.

During the past twenty years public health undertakings have developed

more rapidly, both in scope and effectiveness, than in the hundred years preceding. These developments have not been restricted to certain places or organizations but have included the activities of all governments, national, provincial and local, and the work of voluntary organizations. The results have been most gratifying. Formerly more than half of the infants born died during the first year of life. This mortality was taken for granted and the usual causes given were inherited weakness or inability to digest food. We now know that a major cause of infant deaths is disease of the intestinal tract, especially in those artificially fed. Safe water, the pasteurization of milk, and cleanliness in food handling have changed the picture. Following the introduction of pasteurization, the reduction of infant mortality was so marked that all are now agreed that the milk supplies of all communities should be so treated. Of recent years there has been a most satisfactory decline in tuberculosis mortality; a lowering incidence of the other important communicable diseases; and an increasing life expectancy. All this is not by chance but is the result of persistent effort on the part of all those interested in public health undertakings.

We now realize that part, at least, of the burden of illness can be reduced, since a large proportion of the ills from which we suffer is preventable. In meeting the problem of sickness, it is logical that the efforts should be centred in attempting to prevent those diseases for which methods of control are established. Public health authorities have met with considerable success in such efforts. The medical profession, with the public health authorities, have applied the specific measures for prevention in diphtheria, scarlet fever, and typhoid fever. In earlier years, physicians were concerned almost entirely with the cure of disease, and medical schools taught cure rather than prevention. To-day preventive medicine and curative medicine are one, and physicians are concerned with the practice of preventive medicine as well as with the care of persons who are ill. There is a co-ordinated program for looking after all the problems connected with both the individual and public health. The providing of medical clinics and their more extended use have drawn the public more and more to the profession and to the public health authorities for advice and guidance. In meeting the ever-increasing demands of the public and in the development of plans to meet these needs, public health leaders look for sympathetic understanding, assistance and co-operation from the medical profession, the voluntary health organizations, and all welfare agencies.

In the development of public health in Canada, the Canadian Public Health Association has played a conspicuous part. The organization has from its beginning striven for the adoption of sane, uniform practices and standard procedures. Year after year, coincident with its growth, new obligations have been assumed and others have been placed upon it. As the professional society of public health workers in this country it has, with marked success, carried out studies and surveys on housing, duties and responsibilities of health officers, health budgets, rural health administration, standards for nursing services, accident prevention, and other subjects. Sections have been established in Child Hygiene, Industrial Hygiene, Mental Hygiene, Laboratory Procedure, Public

Health Education, Public Health Engineering, Public Health Nursing, Social Hygiene, and Vital Statistics and Epidemiology. The knowledge accumulated through these activities has been passed on to medical officers of health, nurses, sanitary officers, and other health workers. For many years the Canadian Public Health Journal has been the Canadian medium for the distribution of public health knowledge. This journal now occupies a prominent place among scientific magazines and a pre-eminent one among those devoted exclusively to health; consequently its value cannot be overemphasized. Through it, members are kept in contact with the organization between meetings and are, through the years, kept informed on all new and influential developments in public health. All this has been accomplished by zealous, part-time, non-salaried workers. The amount of voluntary service has reached a point where it is most difficult to continue: so much so that the Association is, just now, at a crisis in its existence. We have arrived at the "parting of the ways". An urgent need is a full-time secretary to deal more completely with all our affairs, including annual meetings, rural health conservation contests, sanitary inspectors' examinations, the work of committees, and other responsibilities. If we are to continue and develop, an increased revenue is imperative. I desire to speak particularly of the valuable financial assistance given to the Association during the past three years by the Canadian Life Insurance Officers Association. The rapid growth of the Association during the past few years would not have been possible without this generous financial assistance. We thank these gentlemen and assure them that their confidence has not been misplaced.

Our organization has had a past of noteworthy service to the public. We cannot, however, rest upon these laurels. We must march forward and the financial difficulties that confront us now should serve to stimulate us towards greater achievements for the future. As President of the Canadian Public Health Association, I desire to impress upon all members, present and absent, the desirability of their taking definite and immediate steps to improve the financial position of the Association. To those pioneers who are no longer with us and to those who are now valiantly carrying on in the face of tremendous difficulties, we owe much. This debt can be paid only by continuing their work and by following their path of unselfish devotion to our national health association.

# An Outbreak of Staphylococcal Food Poisoning

JAMES ROBERTS, *Medical Officer of Health*  
W. J. DEADMAN, *Director of City Laboratories*  
and F. J. ELLIOT, *Chemist, City Laboratories*  
*Hamilton, Ontario*

**D**URING the period March 9-15, 1938, illnesses were reported to the Department of Health of Hamilton, Ontario, of members of five families suggestive of food infection. Twenty-one persons were reported as being ill. Investigation of the cases in the first family indicated that meat, which was first suspected, was not the cause, and that custard-filled pastry was the only article of food eaten by the whole family which could be considered a possible source of the illness. Investigation of the members of other families supported the incrimination of the custard-filled pastry, as the only members unaffected were those who had not eaten the pastry. Water, milk and other food supplies were ruled out early in the investigation, the milk and other foods not being of common origin and the water, except in one case, being from the city supply.

The interval of time elapsing between the meal and the symptoms varied from 1½ to 4 hours. Those who became ill all suffered abdominal pain, vomiting, and diarrhoea. Several patients were acutely ill for a short period. Investigation of the five families elicited the following information.

## *Family P.*

The family, consisting of Mrs. P. and three sons, suffered acute illness on the evening of March 10th. There was nothing suggestive of the cause of the illness either in the breakfast or dinner, which varied. The family had supper at 5.30 p.m., consisting of steak, fried potatoes, and custard-filled pastry (Dutch pastry). At 6.15 p.m. the youngest son was nauseated, vomited, and later complained of cramps and diarrhoea. At 6.45 p.m. the eldest son was nauseated and suffered similarly. The second son attended a theatre and became ill at 8 p.m. The mother had similar symptoms, with vomiting, at 9.45 p.m. Thus the entire family suffered illness and all had eaten the pastry.

## *Family W.*

The household consisted of Mr. and Mrs. W., a son 3½ years old, and Mr. N., father of Mrs. W. They became ill at 9.30 p.m. on March 13th. For dinner the family had had pea soup, bread and butter, tea and milk. At supper the meal consisted of toasted cheese sandwiches, cream pie, and tea and milk.

With the exception of Mr. N., who had not eaten the cream pie, all the members of the household suffered pain in the stomach, followed by vomiting and diarrhoea. The pie had been stored in a paper box outdoors and had been used the day following its purchase.

*Family B.*

This family consisted of Mr. and Mrs. B., A.B. (6 years old), P.B. (6 months), and Mr. J.B., Mrs. B.'s father. Illness occurred on the evening of March 12th. There was nothing in the diet of the family during the day which accounted for the illness. Early in the evening, A.B. ate a vanilla cream square, a supply of which had been purchased at 5 p.m. from a nearby bake-shop. At 10 p.m. Mr. B., Mrs. B., and Mr. J.B., ate a number of the vanilla cream squares, and in addition six whipped cream cakes. At 11 o'clock A.B. was seized with violent vomiting. At 1 a.m. Mrs. B. was ill, complaining of severe abdominal pain accompanied by vomiting. She fainted three times. At 2 a.m. Mr. B. became ill with the same symptoms and suffered diarrhoea. Both Mr. and Mrs. B. had eaten two of the cream squares. Mr. J.B. was taken violently ill during the night with similar symptoms and collapsed in the bathroom at 3 a.m. He had eaten only one of the squares. Enquiry showed that friends who had eaten the whipped cream cakes had not become ill.

*Family B. (No. 2)*

The family consisted of Mr. and Mrs. B., Mr. J.S., Mrs. S., and S. (6 years old). The members suffered illness on the night of March 12th and again on March 13th. The family had used cream squares from the same bake-shop as the other family B. For supper on March 12th Mrs. B. ate one square, Mr. B. half a square, and Mrs. S. half a square. During the night Mrs. B. was ill with diarrhoea but did not have vomiting. Mrs. S. also suffered diarrhoea without vomiting. At supper on March 13th Mrs. B. ate half a square. She was taken ill at church, fainted, and had vomiting and diarrhoea. At 10 p.m. she was acutely ill and was seen by a physician. Of the three other members of the household who had eaten cream squares, two became ill.

*Family O.*

The household consisted of Mr. and Mrs. O., J.O., O.O., R.K. (a boarder), and G.L. (a visitor). The entire family had supper which included vanilla slices and cream rolls. One vanilla slice was eaten by each person and the cream rolls by only two members. The pastry was purchased at the same bakeshop that supplied the families previously mentioned. All the members became ill between 9 and 10 p.m. on March 12th, with gastric distress, vomiting, and diarrhoea.

In these histories the pastry goods were purchased from a common source. A detailed inspection of the premises and materials used in the manufacture of the pastry was carried out. Particular attention was given to the preparation of the custard-filled pastry. The custard was prepared in the ordinary manner



by boiling milk and adding corn starch, sugar and eggs. The mixture was again boiled, cooled, and placed on the pastry, using a cup. Fresh custard was made every day. No refrigerator was provided during the winter months, the room at the rear of the bakery being used as a chill-room. The bakery prepared cream goods for only five months of the year. It was customary to prepare the cream goods before 10 o'clock and to dispose of them before supper. Left-overs were destroyed. In transferring the filling to pastry shells, cotton bags were employed and operated by hand squeezing. In this process the bare hands came into direct contact with the product. A knife was used for spreading icing. The bakeshop was found to be clean and in good condition. Utensils were clean, individual towels were provided for the employees, and there were an ample supply of hot and cold water and adequate toilet facilities.

Careful investigation of the first family who were taken ill was immediately made by members of the laboratory staff while the family was under treatment at the General Hospital. All employees of the bakery were carefully examined and bacteriological tests made. Laboratory studies of the cream pie, lemon roll, and vanilla slices showed the presence of *Staphylococcus aureus*. This organism was isolated also from the gastric contents of members of the P. family while in hospital, and from the faeces. The same organism was isolated from jam pails, pastry bags, and milk taken from a can at the bakery. The findings are presented in tables I, II and III.

TABLE I  
BACTERIOLOGICAL EXAMINATION OF PERSONNEL OF BAKERY

Individual	Activity	Age	Temperature	Culture No.	Source	Organisms isolated	Typhoid and paratyphoid	Widal
W. A. S.	owner	28	98°	507 510 498 489	Urine Stool Nose Throat	<i>Bacillus coli</i> ... ... <i>Staphylococcus aureus</i>	Negative Negative ... ...	Negative T.A.B. .. .. ..
B. S. . . .	clerk		98.4°	481 512 490 491	Urine Stool Nose Throat	... ... ... ...	Negative Negative ... ...	Negative T.A.B. .. .. ..
J. T. . . .	clerk	25		480 508 492 493	Urine Stool Nose Throat	... ... ... ...	Negative Negative ... ...	Negative T.A.B. .. .. ..
L. F. . . .	filling and icing clerk	23	99° throat red	478 509 502 503	Urine Stool Nose Throat	... ... <i>Staphylococcus aureus</i> <i>Staphylococcus aureus</i>	Negative Negative ... ...	Negative T.A.B. .. .. ..
A. N. . . .	messenger boy	18	99° healing pustule on left hand	479 511 496 497 498	Urine Stool Nose Throat Pustule	... ... ... ... <i>Staphylococcus aureus</i>	Negative Negative ... ... ...	Negative T.A.B. .. .. .. .. ..
H. B. . . .	mixed fillings	20	99° red throat	476 513 494 495	Urine Stool Nose Throat	... ... <i>Staphylococcus aureus</i> <i>Staphylococcus aureus</i>	Negative Negative ... ...	Negative T.A.B. .. .. ..
A. A. . . .	baker	22	98.6°	477 514 500 501	Urine Stool Nose Throat	... ... ... ...	Negative Negative ... ...	Negative T.A.B. .. .. ..

TABLE II  
REPEAT CULTURES FROM BAKERY EMPLOYEES

Individual	Culture No.	Source	Organisms isolated
L. F.....	713 714	Nose Throat	<i>Staphylococcus aureus</i> ....
H. B.....	715 716	Nose Throat	.... <i>Staphylococcus aureus</i>
A. N.....	719	Nose Throat	.... ....
W. A. S.....	717 718	Nose Throat	<i>Staphylococcus aureus</i> ....

TABLE III  
BACTERIOLOGICAL EXAMINATION OF MATERIALS

Material	Source	Culture No.	Organisms isolated	Typhoid and paratyphoid	<i>B. botulinus</i>
Pastry bag I.....	from bakery	515	<i>Staphylococcus aureus</i>	Negative	Negative
Pastry bag II.....	" "	516	<i>Staphylococcus aureus</i>	"	"
Jam pail I.....	" "	453	<i>Staphylococcus aureus</i>	"	"
Jam pail II.....	" "	454	<i>Staphylococcus aureus</i>	"	"
Butter.....	" "	466	....	"	"
Milk.....	" "	452	<i>Staphylococcus aureus</i>	"	"
Shortening (Primex).....	" "	468	....	"	"
Sugar (granulated).....	" "	463	....	"	"
Icing sugar.....	" "	465	....	"	"
Vanilla concentrate.....	" "	467	....	"	"
Corn starch.....	" "	464	....	"	"
Vanilla slice.....	" "	455	<i>Staphylococcus aureus</i>	"	"
Cream pie.....	from family (W.)	456	<i>Staphylococcus aureus</i>	"	"
Lemon roll.....	from family (O.)	457	<i>Staphylococcus aureus</i>	"	"
Gastric contents.....	Mr. S. P.	408	<i>Staphylococcus aureus</i>	"	"
Gastric contents.....	Mrs. A. P.	409	<i>Staphylococcus aureus</i>	"	"
Faeces.....	Mrs. A. P.	417	<i>Staphylococcus aureus</i>	"	"

A further outbreak occurred between May 22nd and May 31st, when eight persons in four families suffered attacks of vomiting and diarrhoea following the consumption of vanilla slices and cream-filled cakes purchased at the bakery involved in the first outbreak. Further laboratory examinations were made of the employees of the bakeshop. Nasal and throat swabs were taken and subsequent swabbing was conducted weekly. Through the co-operation of the Connaught Laboratories, University of Toronto, a study was made of the strains of staphylococci isolated from the various cream-filled pastries and of the strains obtained from the noses and throats of the employees during the period of observation. The laboratory study was made in the Connaught Laboratories by Mr. R. J. Wilson and the report of the very interesting and suggestive findings is presented in a separate communication.

These outbreaks of staphylococcal food poisoning add further evidence that infection of certain food products with staphylococci may be of more frequent occurrence than has been suspected.

## Laboratory Report of Strains of Staphylococci Isolated during the Outbreak

R. J. WILSON

*Connaught Laboratories, University of Toronto*

DURING the investigation of a recent food-poisoning outbreak in Hamilton, Ontario, a number of strains of *Staphylococcus aureus* were isolated by Dr. W. J. Deadman from the incriminated food, utensils and raw materials used in the preparation of the food, and from the noses and throats of employees at the bakery from which the pastry was purchased. Since the report by Roberts, Deadman and Elliot suggested staphylococcus as being the etiological agent in the outbreak, a number of the cultures were submitted to this laboratory for further investigation of their toxigenic and biochemical properties.

The data listed in table I reveal that strains 456, 457 and 516, which were isolated from the incriminated food and from bakery utensils, are markedly similar with regard to pigmentation, \*Lh dose, the production of haemolytic zones on sheep's blood agar,  $\alpha$  and  $\beta$  haemolysin production, and the ability to coagulate citrated human plasma and to ferment sugars. The significance of the similarity of these three strains in toxin production (as measured by the Lh dose) is greatly enhanced by the fact that strains of staphylococci which will produce a toxin with an Lh dose of 0.05 cc. or less are not common. It seems reasonable to assume, from the above evidence, that the culture isolated from the pastry bag in the bakery (516) is identical with those found in the incriminated food (456, 457).

The toxigenic properties of the cultures isolated from noses and throats of the bakery employees divide the strains into two distinct groups (table I). The first includes strains isolated from (1) Mr. W.A.S., 489 and 717; (2) Mr. H.B., 494A, 495A and 716; (3) Mr. A.N., 498. The second group includes strains isolated from (1) Mr. H.B., 494B and 495B; (2) Miss L.F., 502, 503 and 713. The micro-organisms in the first group possess toxigenic properties that are strikingly similar to those of the micro-organisms isolated from the incriminated food, while those in the second group produce toxins of a markedly lower potency. This latter difference is sufficiently significant to obviate the possibility of there being any connection between the strains in group two and those found in the incriminated food.

Further examination of the cultures in group one shows that, by means of the several tests employed, all of the strains are identical with one another, and with the three strains isolated from the contaminated food and bakery utensils. It has been further demonstrated by means of the kitten reaction described by Dolman *et al* (2, 3) that micro-organisms isolated from the food (457) produce

\*The Lh dose of staphylococcus toxin is that amount of toxin which will neutralize 1 Standard Unit (International) of staphylococcus antitoxin (1).

enterotoxin. By the same method, strains 489, 494A, 495A and 489 were shown to be enterotoxigenic. Repeat cultures (716, 717) taken from the noses and throats of the employees subsequent to the outbreak revealed that the micro-organisms were present after the clinical manifestations of a throat infection had disappeared.

The data furnished by this investigation leave little doubt as to the etiological agent of the outbreak and the source of infection of the food. There are several points of interest of which particular note might be made. Since the micro-organisms were so widely disseminated throughout the bakery, it seems reasonable to believe that one person had spread the infection to his fellow employees and thence it was conveyed to the raw materials, utensils and finished food products. Although the epidemiological investigation showed that the bakery was in a sanitary condition and that reasonably good care was exercised in handling of the finished products, such widespread infection among the employees created a hazard that could scarcely be obviated by the usual means of control. Adequate refrigeration of the cream filler and the finished products in the bakery to prevent growth of the contaminating micro-organisms and elaboration of the enterotoxin would not ensure that such precautions would be taken after the pastry had been purchased. Further, it is evident from the repeat cultures (716, 717) that the absence of clinical evidence of a nose or throat infection in the employees was no indication that they were not harbouring the micro-organism.

Between May 22nd and May 31st, 1938, eight or nine persons in four families were reported to have suffered from attacks of vomiting and diarrhoea following the consumption of vanilla slices and cream-filled cakes purchased at the bakery involved in the outbreak reported above.\* In each instance, those members of the family who did not partake of the pastry remained well.

Nose and throat swabs had been taken from all the employees at the bakery both at the time of the previous outbreak and weekly subsequent to that date, and examined for the presence of staphylococci of the type responsible for the outbreak in March. It was found that the micro-organism was present in the noses and throats of the employees three weeks after the first outbreak (table I) but had disappeared at six weeks. However, two of the employees who were not harbouring the micro-organism at the time of the first outbreak were found to be infected six weeks later. One of these remained so for three weeks, but the micro-organism had disappeared from his nose and throat before the recurrence of the food-poisoning. The other employee harboured the organism for at least a month previous and a week subsequent to the second outbreak.

The micro-organisms isolated both from the nose and throat swabs of these two employees and from the food implicated in the second outbreak resembled in all of the tests employed in table I the strain implicated in the outbreak in March. The ability of these micro-organisms to produce enterotoxin was shown by means of the kitten-test (2).

*\*The reports and cultures were submitted by Dr. James Roberts, Medical Officer of Health, Dr. W. J. Deadman, Director of City Laboratories, and Mr. F. J. Elliot, Chemist, City Laboratories, Hamilton, Ontario.*

The weekly examination of nose and throat swabs from the employees revealed the fact that the micro-organism persisted for some weeks in each individual, and that the persistence of the infection in the bakery was due to the spread of the infection among the members of the staff.

The presence of this type of staphylococcus in noses and throats of individuals over long periods of time raises the interesting possibility of staphylococcus carriers. The strain Barss used by Dolman *et al* in their work on staphylococcus enterotoxin (2) (3) persisted in the nose of the person from whom it was isolated, over a period of at least three years. During that time several cultures were taken, and showed no measurable change in toxigenic powers. It would seem reasonable to believe that persons suspected of harbour-

TABLE I

CULTURES OF STAPHYLOCOCCI RECEIVED FROM THE CITY LABORATORIES, HAMILTON GENERAL HOSPITAL

Group	Strain	Source	Pigmentation	Haemolysis on Sheep's Blood Agar		Toxin Production			Kitten Test	Plasma Coagulase	Lactose	Mannite	Sucrose	Maltose	Dextrose	
				Primary Zone	Secondary Zone	$\alpha$	$\beta$	Lh dose								
1	456	Cream pie. ....	aureus	wide	none	1024	256	0.05-0.07	+	+	+	+	+	+	+	
	457	Lemon roll. ....	aureus	"	"	1024	256	0.05		+	+	+	+	+	+	
	516	Pastry bag. ....	aureus	"	"	1024	256	0.05		+	+	+	+	+	+	
	489	Throat, W.A.S. . .	aureus	"	"	1024	256	0.05-0.07	+	+	+	+	+	+	+	
	*717	Nose, W.A.S. ....	aureus	"	"	1024	256	0.05		+	+	+	+	+	+	
	494a	Nose, H.B. ....	aureus	"	"	1024	256	0.05		+	+	+	+	+	+	
	495a	Throat, H.B. ....	aureus	"	"	1024	256	0.05	+	+	+	+	+	+	+	
	*716	Throat, H.B. ....	aureus	"	"	1024	256	0.05		+	+	+	+	+	+	
	498	Infected knuckle, A.N. ....	aureus	"	"	1024	256	0.05		+	+	+	+	+	+	
	2	494b	Nose, H.B. ....	lemon	"	"	256	128	0.2							
		495b	Throat, H.B. ....	lemon	"	"	256	128	0.2							
		502	Nose L.F. ....	aureus	narrow	none	128	32	0.5							
503		Throat, L.F. ....	aureus	"	"	128	32	0.5								
*713		Nose, L.F. ....	aureus	"	"	128	32	0.3								

\*Repeat cultures taken 3 weeks after the outbreak.

Kitten tests were done only on strains 457, 489, 494a, 495a and 498. These were selected as being representative strains.

ing these micro-organisms should be excluded from food handling until such time as several successive nose and throat swabs, taken at weekly intervals, showed the absence of the type of staphylococcus implicated in food-poisoning outbreaks.

The widespread occurrence of staphylococcal food poisoning, particularly in cream and custard food products, is shown by the numerous reports which have appeared in the literature since it was generally recognized in 1930 (4). The problem of its control has been considered in those parts of North America where it has been most frequently reported, namely California and the neighbouring States; and the California State Board of Health has established regulations for the proper care of cream and custard food products (5). Further, several localities have decreed that this class of merchandise may not be manufactured or sold during the summer months.

## ACKNOWLEDGMENTS

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## REFERENCES

1. Hartley, P., and Llewellyn Smith, M.: Quart. Bull. Health Org. League of Nations, special no. (Jan.), Geneva, p. 68. 1935.
2. Dolman, C. E., Wilson, R. J., and Cockcroft, W. H.: Canad. Pub. Health J., 1936, 27: 489.
3. Dolman, C. E., and Wilson, R. J.: J. Immunol., (In course of publication).
4. Dack, G. M., Carey, W. E., Woolpert, O. C., and Wiggers, H.: J. Prev. Med., 1930, 4: 167.
5. U.S. Treas. Dept., Pub. Health Rep., 1937, 52: 930.



# Staphylococcal Food Poisoning in Billings, Montana

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ON May 26, 1936, information was received by the State Board of Health of the occurrence of an outbreak of food poisoning in Billings, Montana.

The investigation showed that various forms of custard- and cream-filled cakes were used by almost all of those who suffered illness. These cakes had been suspected of causing the poisoning by the medical officer of health and by several of the physicians attending the cases. Several cases of illness occurred also in Laurel and samples of the suspected cake had been sent to the laboratory of the State Board of Health for examination. The study showed that cases of illness had occurred as early as May 16th, both in Billings and in Laurel. The major outbreak, however, occurred during the period May 23rd to May 26th. More than fifty cases were investigated and probably a number of other cases occurred with milder symptoms.

Samples of the cake-filling used in the bakery and from suspected cakes in Billings, as well as samples from Laurel, were bacteriologically examined. A number of colonies of staphylococci were found in the sample of filling taken from the ice-box of the bakery. Almost pure cultures of staphylococci were obtained from the fillings of the cakes examined. The marked increase in the number of staphylococci present in the filling of the cakes, as compared with the filling taken from the ice-box, is accounted for by the warm weather, as indicated in the Weather Bureau reports for the period May 15th to May 28th.

After being prepared at the bakery, the cakes were enclosed in cellophane casings and delivered to various grocery stores and restaurants. The cakes were kept in show-cases without refrigeration. The filling used was made of flour, eggs, water, sugar, and flavoured with orange oil. The filling was made twice weekly, being cooked and subsequently stored in a mechanical refrigerator. Some of the cakes were of two layers, with marshmallow and cocoanut icing.

Study of the following case notes indicates that the patients suffered an acute illness developing within four or five hours after the infected food was eaten. The majority suffered marked abdominal pain followed by vomiting and frequent bowel movements, in some cases as many as twenty. The symptoms

usually subsided in six to ten hours after the onset. The patients suffered severe prostration, as evidenced by cold, clammy skin and marked sweating, and complained of weakness from twenty-four to forty-eight hours after the disappearance of the acute symptoms. The picture was that of an acute intoxication rather than bacterial invasion.

*Family M.*

On Saturday, May 23rd, Mrs. M. purchased a layer cake and ate a piece of it on Sunday evening. About 9 p.m. she complained of severe cramps, vomited four times, had three bowel movements, and continued to vomit and have bowel movements for two or three hours. She placed a piece of the cake in her husband's lunch-box and he, being engaged in night work, had his lunch at midnight on May 25th. At 3.45 a.m. he suffered illness, vomited five or six times, felt chilly, and was markedly prostrated. Ten minutes after the first vomiting, he had violent bowel movements which were repeated six or eight times in the next few hours. Not associating the cake with the illness, Mrs. M. again placed a piece of this cake in her husband's lunch-box. He ate this on Monday, May 26th, at midnight. At 2.50 a.m. he again suffered illness, vomited six times within an hour, and had four bowel movements between 3 and 6 a.m.

*Family W.*

The W. family consisted of six members, three adults and three children. Investigation showed that a layer cake from the same bakery had been eaten by the family on the evening of May 23rd. Four hours after the meal the father vomited and bowel movements commenced half an hour after the vomiting. During the night he vomited fifteen to twenty times, with bowel movements each time. The mother became ill about half an hour after her husband and suffered a similar illness. The maid was nauseated but did not vomit. A daughter of high-school age also complained of illness but did not vomit. The remaining member of the family did not complain of being ill.

*L. luncheon*

A luncheon was served on May 18th to a group of eight men. Five who partook of the layer cake which was served suffered severe vomiting and diarrhoea. The two who were not ill did not eat the cake, and a positive history could not be obtained of the remaining person who was ill. The symptoms developed between 3 and 4 o'clock in the afternoon and the histories were identical with those previously given.

*Miss S.*

Miss S. purchased a cake from the same bakery on May 22nd, eating part of it at lunch. At 5 p.m. she became sick and vomited, ten bowel movements occurring. She complained of abdominal pain and cramps in her feet and legs. On May 24th she had another piece of the same cake at her evening meal.

Similar symptoms developed within a few hours, of such severity that she was removed to the hospital and received treatment for forty-eight hours.

*Family T.*

Mrs. T. and her young son each ate two orange rolls made by the same bakery at 10 p.m. on May 23rd. During the night she vomited and had five bowel movements, and suffered marked weakness on the two following days. Her son did not vomit but felt indisposed on the following day. The amount of filling in the orange rolls was much smaller than that used in the cakes. Two other members of the household who did not eat these rolls were not sick.

*Family P.*

Three of the four adults in this family were removed to hospital. Following supper on May 17th, which included a layer cake from the same bakery, they had been taken ill with vomiting and diarrhoea of a type similar to that already described.

*M. party*

On the night of May 23rd a party was held in the country, attended by about thirty persons. One large cake had been purchased from the bakery in the afternoon and was divided into sufficiently small portions to serve all those desiring cake. Four of the adults attending the party became ill in from four to five hours after the meal. One who did not become ill until 11 o'clock the following morning died about 5 p.m. On enquiry it was found that the family of the host of the party had bought a similar cake on May 16th. The family consisted of the husband and wife and four children. On the evening of the 16th the cake had been served at supper, but the husband and the youngest child did not eat any of the cake. The mother and the other three children partook of the cake and suffered acute illness during the night, with vomiting and diarrhoea. It would appear that these cases were the first of the cases which occurred.

*Family McQ.*

In this family five adults suffered on the evening of May 24th severe vomiting and diarrhoea between 10 p.m. and 12.30 a.m. They had served a layer cake of the type associated with the illnesses reported by other families.

*Family McI.*

This family ate a similar cake on May 24th and suffered illness. On the following day Mrs. McI. gave the remainder of the cake to her son and his wife, who in turn suffered acute illness.

In addition to these cases, physicians reported a number of other cases. One physician reported four cases having similar symptoms and a history of eating the cake; and in another family, two persons who had eaten a cake on May 18th. Another physician reported two cases, and a third physician two

cases in one family on May 17th and an additional case in the same family on May 18th.

Investigation was made also of cases reported in Laurel. The physician reporting the cases had made a careful study of the outbreak and had forwarded samples of the cake to the State Board of Health laboratory for examination. He reported ten cases on the night of May 21st and on the morning of May 22nd. The ten cases occurred within twenty-four hours. All were marked with severe prostration, vomiting and diarrhoea, and three cases had blood in the stools. A portion of the suspected cake had been fed by the physician to his dog, and the dog had suffered illness. The physician had concluded from his observations that the cake was the source of the illness.

Another physician in Laurel reported five cases, three of which had occurred in one family on May 16th, and two cases on May 25th. In each family cake of the same type, from the same bakery, had been used.

#### LABORATORY FINDINGS

Examination of samples taken from the original lot of filling for the orange-cream cake, together with a piece of filled cake received directly from the bakery on May 26th, were examined, as well as a sample sent from Laurel and samples obtained by Dr. Kilbourne following his investigation. The latter included a package of orange rolls and a sample of cake. The orange rolls were ordinary bread rolls with a small quantity of orange-cream filling inserted in the top. Smears made directly from the fillings revealed staphylococci in large numbers, the filling taken from the cake being the more heavily laden with organisms. A sample of lemon cream cake was sent from Laurel on May 27th and examination also showed the presence of staphylococci in large numbers in the filling. The strain proved to be a chromogenic strain of staphylococci (yellow), producing acid in carbohydrate broths and slight liquefaction of gelatin. The various cultures of staphylococci were grown in carbohydrate media, including sucrose, mannite, dextrose, maltose, lactose, galactose, and rhominose. Reactions typical of *Staphylococcus albus* were obtained. In gelatin stabs a slight cup-like liquefaction occurred. *Staphylococcus aureus* as well as *Staphylococcus albus* strains were recovered from the orange rolls. It is evident that both *Staphylococcus albus* and *aureus* were associated in the poisoning. In this connection, Jordan and Burrows (1) have pointed out that the toxigenic powers of staphylococci can be considerably increased by growth in a starch medium. This may explain the high toxicity of the strains.

The investigation did not reveal the source of the contamination of the filling. On the discontinuance of the distribution of cakes with such fillings, no further cases occurred.

#### REFERENCE

1. Jordan, E. O., and Burrows, Wm.: Proc. Soc. Exper. Med. & Biol., 1933, 30: 448.

# Some Factors Concerning the Care of the New-Born\*

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THE nutrition of the new-born infant is the most important stage in the feeding of infants because the establishment of breast feeding, while it should be a natural function, is, in modern times, difficult; and yet breast feeding is the most successful form of nourishment. And, finally, if the infant requires artificial feeding the tolerance of the new-born infant to foreign food is extremely low, and any break in tolerance at this early period is almost invariably the cause of future troubles in nourishment.

Breast feeding (1) is a function of which there should be little to learn in the year 1938, yet never probably has breast feeding given so little cause for satisfaction as at this time. During a survey made a few years ago by the author (2) it was found that Canadian mothers nurse their infants less than do foreign-born women; that the well-to-do of Toronto and environs nurse their infants less than do those of the poorer classes; that maternal nursing is less to-day than it was twenty-five or thirty years ago in Canada, but that in view of propaganda in the child welfare clinics of this city there has been a slight improvement; that the infrequency of nursing depends chiefly on the ignorance and impatience of the laity together with the indifference of the physician.

The late Abraham Jacobi, in New York, stated that "there is no such thing as complete absence of breast milk; that every woman can nurse her infant, even the flower and fashion of the land". Every physician will find that there are some women who cannot, such as those suffering from debilitating diseases and the neurotic type; but unfortunately it has become the rule in all too many instances for the physician to state that the milk does not agree with the infant, without an adequate trial, the result being that the child is fed according to the "canned directions", frequently with unsatisfactory results.

Many babies are weaned in the first few weeks of life. In some cases it seems natural feeding is not attempted. Every country records a similar experience. Even in child welfare centres, where breast feeding is the first article of a universal creed, the percentage of breast-fed babies never reaches 100.

"The issue cannot be dismissed on economic grounds, since the poorest mothers are not those who commonly find difficulty in breast feeding. Arbitrary decisions to wean must also of necessity be discounted as a large factor. But there may have been something of a moral change, wide set in the community, that injures breast feeding nearer its source, since success-

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ful nursing seems no longer to be considered a matter of prestige. The privileges of breast feeding have somehow become overshadowed, and there is common ignorance as to what functioning actually entails. Here, if she but knew it, the mother may find some of her best experience in a service of unequalled value to a child. Yet women seem very often not to be oppressed by their failure in this, that is act and pact of true motherhood.

"There are many women who still nurse their babies successfully and who would never fail in this duty, but these do not predominate amongst the educated class. Women of this sort feel the impress of any factors operating nervously and physically to disturb balance, and simple processes are apt to become difficult. In spite of a cult of parentcraft, it is here that the most elementary of its privileges becomes most readily abandoned, and the child suffers the injury of weaning.

"There are mothers who say that in spite of much eagerness they have failed to secure the necessary teaching in breast feeding. Certainly some mothers require tuition. The doctor in charge may often be sorely tried if his training has shown him more of artificial feeding than of the subtle details of nursing technique. The person most intimately associated with the mother, however, is the nurse, and she it is who, a figure of undisputed authority, is alleged most often to find the greatest difficulty in keeping the baby at the mother's breast. All of these factors may account in part for a problem that if it were real, i.e. biological, would surely be of the most serious that any generation could meet.

"There are further interferences still that have little to do with physiology. The field for commercial exploitation is large in this connection, and makers of artificial foods vie with one another in proclaiming the virtues of their wares. Mothers receive the full onslaught of a whirlwind of advertisements and of propaganda most ingeniously worded to assail their faith. Before their time is come, almost, they have begun to believe that they 'can't nurse their babies,' or that the offspring of their efforts will be bonnier if not subjected to the toils of the breast. Breast feeding in consequence has not gained in public estimation and many who would, have not dared persevere, under the implication that this is an ordinary way of infant nurture, and that babies must not be deprived of anything 'scientific' or 'good' merely to save the instinct of the mother to nourish and care for them herself. In these circumstances the first onset of symptoms natural to a new physical activity is apt to be acclaimed as a proof that 'the breast is not agreeing,' or delays are quoted as evidence, before there is any reason to doubt the response. Fathers, anxious that their wives should be comfortable, are readily persuaded of the 'strain' of breast feeding. Utterly anticipated by the interests concerned, the present-day passion for 'hygiene' has here failed to make good, and there has been no crusade to come to the aid of nature and good sense. The truth, however, remains as it was. Breast feeding is a function that depends in the first place on good general health. The general health of the community has improved incontestably with better habits of dieting and hygiene and a raised standard of living since the war. There is every reason to suppose that with a little due concentration and the necessary statement of relevant facts, breast feeding should be easier and more certain than ever before."<sup>(1)</sup>

The cause of the greater percentage of deaths among bottle-fed babies, as compared with breast-fed babies, is not artificial feeding *per se*, since among the well-to-do, bottle babies do well. The secondary factors are bad milk, unsuitable food, improper methods of feeding, lack of maternal care, bad surroundings, heat, humidity, dirt, and overcrowding, which favour spread of infection. These common errors are too well known to need amplification at the present day. Methods of artificially feeding the normal infant to-day are simple and productive of most satisfactory results. It behooves the physician in general practice to familiarize himself with the various procedures. No medical student graduating to-day from a grade A university is without such knowledge, for during his undergraduate years he has had much attention focused on the normal growth, both mental and physical, of the infant.



Deaths from respiratory diseases are common in the neonatal period. This condition will not be improved until both physicians and the public appreciate the importance of aseptic nursing, and that these diseases are transmitted through droplet infection and that it is not simply the case of "open the window and influenza". How common is the experience that fathers, grandmothers, aunts, children, etc., gather round to "gloat" over the new addition to the family, and during the process distribute, or better "spew", their germs from their noses and throats (there are usually some of them suffering from some type of nose or throat infection) directly on to the new-born infant, who has not been sufficiently long in its new environment to develop any immunity, and the next thing we hear is that the "poor baby died of pneumonia."

The treatment and cure of the comparatively small number of ill babies which come under the surveillance of any one physician in his private practice year by year can influence but little the infant mortality rate. It is, therefore, unbecoming, as well as untenable, for any physician to take the position that organized child-hygiene work in his community will seriously cut into his private practice. As a matter of fact, in these communities where infant-hygiene work has been well conceived and carried out with the hearty co-operation of the medical profession, it has proved satisfactory to physician and mothers alike in making it possible to get the babies at a much earlier period, to forestall their sickness or institute treatment at a time when the best results can be obtained.

So far then, let me state that neonatal mortality can be greatly reduced through intensive observation and fulfilment of: (1) encouragement of maternal feeding; (2) better artificial feeding; (3) the prevention of respiratory diseases.

With these facts in mind, I will endeavour to lay down the general plan that I feel is most successful for the natural nourishment of the new-born infant. The infant, of course, should be put to the breast at the expiration of eight hours following birth, and then regularly every eight hours for the first forty-eight hours, and then at the regular periods of every three or four hours, according to which interval has been decided upon. Until the baby has been fully established upon the breast, probably for the first five or six days, it has been my plan to recommend the following solution to be given liberally in between nursing: 3 per cent. gelatin, 5 per cent. glucose and 0.5 per cent. sodium chloride. This solution, recommended by Kugelmass, reduces birth shock, increases the clotting time, and certainly will prevent water loss. It has been my experience that the infants given freely of this solution do not lose the usual amount of weight following birth.

#### *Selection of Feeding Interval*

It has been our plan to use either the three- or four-hour interval; it is to be borne in mind that the infant's stomach does not empty of breast milk under two and a half hours, so that more frequent feeding than the three-hour interval is against physiological principles.

For premature babies or small infants under the normal birth weight, we use the three-hour interval; for the average vigorous infant, the four-hour

interval. If, however, on the four-hour interval the infant does not get an adequate supply of breast milk, it is changed back to the three-hour interval, and vice versa.

### *Complemental Feeding*

It frequently becomes necessary to make up a deficiency in breast milk with an artificial feeding. This artificial feeding should be given only if the baby is getting an inadequate supply of breast milk from both breasts, and the following general factors should be borne in mind in connection with breast feeding. These instructions we give to the mother, who finds them helpful.

## INSTRUCTIONS TO MOTHERS

### *Principles underlying the Secretion of Milk*

There are three facts in regard to milk production which you should know to enable you to nurse your baby successfully. A mother requires an increased amount of nourishing food and an increased amount of fluids. The fluids should not be increased to the point where they interfere with her appetite for regular meals. The diet should be well balanced, plain and wholesome, slightly more than the usual amount. One quart of milk daily should be taken. The act of suckling stimulates the formation of milk. If, therefore, there is not sufficient milk in one breast to supply one complete feeding, the two breasts should be used. This extra nursing will stimulate the formation of more milk. The use of two breasts at each feeding increases the amount of milk and does not decrease it, as is sometimes thought.

To maintain an even flow, the breast should be completely emptied at each and every nursing. The practice of dropping a nursing and replacing it with an artificial feeding is one of the most frequent causes of failure.

### *Nursing*

If the baby is acting normally as regards sleep and growth, he is probably getting the right amount.

If the baby is not getting enough milk, a fact which would be indicated by stationary weight or slow gain, by waking before the proper feeding time, etc., then the baby should be allowed to nurse for ten minutes from each breast, at each feeding every three hours.

If the baby at the end of a few days is still not receiving sufficient food, the required amount should be completed after nursing by a modified milk feeding as prescribed.

If the baby is getting too much, a fact which would be suggested by too rapid gain in weight, vomiting, colicky pains, gas, fat curds in stool, then the baby should only be nursed from one breast every four hours.

If the baby vomits, it may be due to obtaining too much milk or to obtaining it too rapidly. In such cases an ounce of water given before nursing may correct the trouble.

If the baby has colicky pains or gas after nursing, hold it in an upright position until it gets rid of the wind which has collected. The easiest way to do this is to hold the baby over your shoulder.

#### COMPLICATIONS

Until ten or twelve years ago I think it was the general impression that when babies suffered from colic it was due to over-feeding with breast milk. We now feel that practically all "colic" in the new-born is due to insufficient nourishment, especially if one bears in mind the observations made after careful study of the average infant and comparing it with the small dog.

##### *Hunger and Colic*

One of the most frequent diagnostic mistakes regarding the nutrition of the infant is the error of confounding colic with hunger in the new-born. New-born infants suffer nowadays not from overfeeding with breast milk, but from a lack of it. For every case of over-feeding we probably see 99 cases of so-called hunger colic. Practically all young mothers, overtaxing their strength in their eagerness to be up and about after their long confinement, harried by old wives' tales and conflicting advice of well-meaning neighbours, secretly afraid of her new baby, and frightened that he is going to die at every squirm and grunt and yawn, run short of milk toward the end of the day.

"Milk production is milk production, whether in woman-kind or the lower animals. A Jersey cow if frightened or teased about her calf will give perhaps a quart of milk at the next milking time instead of the expected three gallons. Even a hog or a dog that drives her from the pasture, or a strange milker will affect the quantity of her milk. A woman is much more susceptible to nervous reactions. Milk production in all our minds is associated with green meadows, still nature and kind-faced old cows standing in quiet streams (not listening to a baseball game or a prize-fight over the radio).

"A modern, educated woman is not a kind-faced, stolid milk machine, and so she always at some time or other runs short of milk. And then the baby cries. And when the baby cries his stomach hurts him. Have you ever thought how the whole world is obsessed with the idea that every time a baby cries his stomach hurts him? The paediatrist has added ears to the list of places a baby can hurt, but when the ears are examined and found normal, then he too usually says the baby's stomach hurts him. So night after night when the tired worried mother runs short of milk, the baby cries. He cries, he screams, he gets red in the face and doubles up; he kicks and straightens out, and rears back in a perfect paroxysm of 'rage'; he gnaws at his fist and his mother's face; he tries with every way he knows to show he is hungry, but still he has the stomach-ache. Finally, when he is comfortably full of hot water or medicaments he goes to sleep, and he awakens the next morning as if nothing had happened. But the next afternoon, late, when the tired family wants to go to bed he 'pulls another party.' He is a smart looking baby; he holds his head up well and his back seems strong. He is preternaturally bright and the neighbours all say they never saw such an intelligent-looking little baby. He is a light sleeper and the whole family has to be quiet to keep from waking him. Occasionally a young father, untrammelled by old women's tales, will have a lucid idea and say 'If that were a puppy I'd say he was hungry and feed it.' And there is no better appeal to their understanding than the illustration of the hungry puppy. The signs of hunger in other animals are usually recognized, because they are not hedged about with a mass of superstition and empirical nonsense. The hungry puppy is wakeful. He wakes with the slightest scrape of the foot on the floor. He gets

up every few minutes and hunts for a softer place to lie. He is the smart dog who handles himself well, and in begging for food is all a-wiggle as if his muscles were of rubber. He is preternaturally smart and bright. Usually he is the runt who is crowded away from the breast by the stronger puppies, and because he appears smarter he is considered the pick of the litter. The full puppy is lazy and stupid and relaxed.

"The full baby is a stupid little animal. One who is easily waked, who is especially smart and intelligent looking, one who handles himself too well for his age, he is a hungry baby. You can walk in the nursery, take one look at such a baby and absolutely diagnose the cause for your visit just the same as you can stand at the foot of the bed and see a rapid respiration with flushed face and an expiratory grunt, and know the baby has pneumonia." (3)

There is no difference of opinion as to the therapy in hunger colic, namely more food.

#### OTHER FACTORS

There are a few factors which are essential in the care of the new-born, quite aside from the nutritional aspect, and which are extremely important from the diagnostic and therapeutic standpoint. The first of these is cyanosis.

##### *Cyanosis*

Cyanosis in the new-born may result from atelectasis, intracranial haemorrhage or congenital defect of the heart. Atelectasis, which is an incomplete expansion of the lungs, usually occurs in premature or debilitated infants but may occur in apparently strong infants. The cyanosis is intermittent. Examination of the lungs frequently discloses nothing abnormal, unless the atelectasis occurs only in a portion of one lung, over which area a diminished air entry can be distinguished. Treatment consists in the prompt administration of 5 per cent. carbon dioxide and 95 per cent. oxygen as given by the Flagg apparatus, an oxygen chamber or Drinker machine. Care should be taken to see that the bronchial tree is freed of mucus plugs. In addition to this treatment the infant should be made to cry vigorously. Congenital heart defects may be recognized on routine examination, while the cyanosis present in these cases is constant and is increased by the effort of crying.

##### *Cerebral Haemorrhage*

Cerebral haemorrhage is the greatest menace that jeopardizes life and well-being of the new-born. A long second stage labour, precipitous delivery and difficult obstetric procedures are the chief offenders. The usual signs of haemorrhage are drowsiness, difficulty in sucking or swallowing, feeble or whiny cry, fretfulness and intermittent cyanosis. It should be borne in mind that one or all of these symptoms may be present in a mild degree in only a difficult birth recovery, without any actual injury. The diagnosis may be confirmed by spinal and cisternal puncture, preferably the latter. Resuscitation of the asphyxiated new-born is more effective, the less drastic the procedure. Obstetrics have justifiably denounced brusque manipulations, not because they are productive of bodily trauma, but rather because they either aggravate an already existing intracranial injury, or may actually produce dural injury, especially in the pre-

mature infant. The veins of an asphyxiated infant are engorged, and hence more readily traumatized, particularly at birth when a tendency toward bleeding may prevail. Very frequently resuscitation appears to have been effective, when a gradually increasing haematoma induces frank symptoms of intracranial haemorrhage on the second or third day. As previously mentioned, 5 per cent. carbon-dioxide and 95 per cent. oxygen should be administered in the form of the Flag apparatus or an oxygen tent, but it should be borne in mind that no carbon-dioxide mixture can stimulate respiration unless the air passages have first been cleared of mucus, and the lungs first expanded. In severe traumatization of the respiratory centres the most effective therapy is to place the baby in the Drinker respirator. All the baby except the head is enclosed in an airtight chamber, and subjected alternately to atmospheric and carefully measured negative pressure. Thus, air is drawn into the lungs by gentle expansion of the chest without danger of pulmonary rupture, which may come with uncontrollable violent efforts with mouth-to-mouth insufflation, or various manipulations attempted in different forms of artificial respiration.

Pressure symptoms resulting from intracranial haemorrhage, or pronounced cerebral oedema as a signal of haemorrhage, may be relieved either through the vascular route or through the cerebrospinal canal. The former involves the intravenous injection of hypertonic glucose for decrease of the degree of cerebral hydration and oedema, while the latter consists of the actual removal of fluid by spinal or cisternal punctures. Cisternal puncture should be done immediately after birth whenever the spinal puncture fails to withdraw fluid. The sooner relief is obtained from the symptoms of pressure below the tentorium, the more hopeful the survival of the infant. The moral problem of sparing an infant from potential spastic paraplegia, if he survives the birth lesion, is a dual issue, because this condition as well as others has unnecessarily been associated with intracranial injury as an etiological factor at birth.

#### *Haemorrhagic Disease*

Haemorrhagic disease is not infrequently a factor, and so every effort must be made early to diminish the escape of blood from the slightly injured vessels in the course of birth trauma, or in the manipulations of resuscitation. The clotting and bleeding times are determined the first day of life when an apparently quiet infant has suddenly become restless and irritable, the cry high-pitched, the breathing irregular with intermittent cyanosis and occasional nystagmus. After cisternal puncture, daily injections of blood should be made to increase the clotting function sufficiently to prevent oozing through the very fragile vessel walls. There is a small group of infants whose mothers have been denied a sufficient amount of protein during pregnancy, to suppress clotting function in the new-born. Finally, there are infants born with a tendency toward haemorrhagic disease, which, if present, together with intracranial injury, aggravates unduly cerebral haemorrhage. These factors, though small, tend to prolong the escape of blood from injured vessels, and this contributes to the causation of the continuance of serious cerebral haemorrhage.

For the convulsions resulting from cerebral injury, the administration of calcium bromide in 3 grain doses every 4 hours between feedings, and the rectal administration of one grain of sodium amytol in one ounce of one per cent. magnesium sulphate solution, is beneficial.

### *Prematurity*

One cannot talk about the neonatal period and care of the new-born without mentioning prematurity. During the five years from 1931-1936 there were 357 prematures born at the Burnside Hospital with a mortality of only 15 per cent. These were all babies that were born in the Toronto General Hospital under ideal circumstances. These figures should be contrasted with our statistics on prematures at the Hospital for Sick Children, which are as follows: during the years 1932-1935 inclusive, there were 277 prematures admitted, of which 154 died—a mortality rate of 68 per cent. In other words, it simply means that the premature baby dies en route to the Hospital.

The fact that our mortality figures at Burnside are so low almost raises the point as to whether it is essential to expend large sums of money constructing air-conditioned rooms for babies when the simple procedures installed at Burnside Hospital a number of years ago seem just as satisfactory.

### *Infections in the New-Born*

The incidence of sepsis neonatorum and the development of diseases as a result of sepsis in the new-born are practically non-existent in the present-day in modern obstetrical services. The only infections with which we really have to contend are those involving the respiratory tract, producing the well-known complications with the high death rate.

We have nothing to suggest as far as new treatment is concerned, but to emphasize the importance of aseptic nursing and the education of physicians, nurses and parents with regard to the prevention of respiratory infections, not only in the neonatal period but throughout infancy and childhood.

### REFERENCES

- (1) Emslie, Margaret: Breast Feeding. Oxford Medical Publications, 1932.
- (2) Brown, Alan: Canad. M. A. J., 1917, 7: 241.
- (3) Rosamond, Eugene: Trans. Alabama State Med. A., April 17, 1928.



# Objectives of Industrial Hygiene

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THE development of the factory system during the past one hundred and fifty years stimulated legislation directed to the control of hazards to health in industry. Some of this legislation considerably antedated general public health legislation, and so the wage-earning section of the population has received rather special attention in health matters. Obviously, a polluted water supply or an epidemic of smallpox presents the same hazard to industrial workers as to others in the community but if the source of livelihood to-day represented by the man's work is associated with disability or premature death to-morrow, its purpose is defeated and safeguards are necessary.

At the same time, the grouping of industrial workers together day after day affords special opportunity for the application of known measures for the upbuilding of health; and the economics of industry dictate support for a healthy personnel.

These considerations are the warrant for a body of factory legislation directed to the protection of the health of workers and more recently, for intensive research to determine the optimum conditions of work directed to the same purpose.

The approach to the investigation of conditions of work since the Great War has been, firstly, the study of production, spoiled work, accident and sickness records. The influence of hours of work, ventilation, lighting, rest pauses and posture has been the subject of recommendations arising out of this type of inquiry. Secondly, the measurement of energy-consumption in performing a specified piece of work under varying conditions has been applied to weight-lifting and carrying, the height and tread of stairs, balance of tools, and other conditions of work. For example, when the actual hours of work in a certain operation were decreased from 57 to 51 there was a pronounced increase in the hourly rate and a considerable increase in total output; such a result is possible only where the operation is not completely dominated by machinery. In a tin-plate factory with hot processes where good ventilation was provided the output in summer was only 3 per cent. less than in winter months, while in two poorly ventilated factories the average output was 11 per cent. and 18 per cent. less in the hot weather; in two silk weaving mills with good artificial illumination the production was 10 per cent. below the daylight rate; one study showed that rest pauses with a change in posture was associated with an increase in production of 30 per cent. over that when no change in posture was provided for. With respect to weight-lifting, studies made to determine the ratio between body weight and the practical load indicated that ratios of practical importance respect-

ing women and young persons in industry were 40 per cent. of the body weight where the lifting was an essential part of the process and 50 per cent. for occasional load carrying. Related to average physical data these percentages would be 45 lbs. and 55 lbs. respectively.

The industrial hazards of the worker may be roughly divided into the following five classes:

1. The danger of contracting a communicable disease as a result of occupation or association with fellow-workmen.
2. Working in atmospheric conditions which are not conducive to proper heat loss from the body.
3. Contact with materials that are not systemically poisonous but cause local irritation.
4. Accidents.
5. The handling and subsequent breathing, swallowing or absorbing through the skin of specific poisons.

#### *Communicable Diseases*

The danger of contracting a communicable disease from fellow workmen is a hazard not to be dismissed without comment. A perusal of mortality records shows tuberculosis to be one of the most important causes of adult mortality. In early adult life as high as one death out of four may be due to this disease. Thus the worker in the course of his daily toil may be infected from one of his fellow-workmen suffering from it. Industrial work often involves close contact. There are certain trades in which the incidence of tuberculosis is very much higher than in the general population. These trades may be divided into two classes: sedentary occupations which attract the type of worker prone to develop or already suffering from tuberculosis, and trades in which there is some specific hazard favouring the development of this disease. The garment trade is an example of the first class, and granite cutting of the second class. Therefore, when in a given trade the mortality rate from tuberculosis is high and the nature of the work is heavy, one can assume with some degree of assurance that a definite hazard favouring tuberculosis exists at the work itself. This is usually due to the presence of silica dust.

#### *Unsatisfactory Atmospheric Conditions*

Man, like a machine, uses fuel in the form of food and produces energy. The body, however, is not 100 per cent. thermally efficient, but must lose heat in order to produce work. Conditions that interfere with heat losses from the body decrease the worker's efficiency greatly and in extreme conditions may affect his health. The more strenuous the work, the cooler the workroom should be. People engaged in sedentary occupations should not work in the same air conditions as men engaged in hard physical labour. High temperatures may be compensated for by increasing the air movement. High humidity reduces the range of temperature in which efficiency and comfort are attained. Working in

hot conditions is associated with a general increase in sickness. Working in hot, wet conditions increases the incidence of pneumonia and rheumatism. When these conditions are associated with sudden changes to low temperature the hazard is further increased. Men working at hot trades should be provided with proper washroom and locker facilities so that dry clothing can be readily put on before leaving. This is especially important in cold weather.

### *Effect of Certain Irritants*

Considerable discomfort, without any serious consequences, is occasioned by many substances handled in industry. In this class come most of the trade dermatoses such as those due to nickel, chrome, rubber and low-grade skin infections like those caused by infected cutting-oil. Some cases of skin disease are entirely due to contact with irritating materials. In others the real cause is a hypersensitive condition of the individual's skin to the materials used; this condition may arise after years of exposure and may make it necessary for the sufferer to change his occupation. Few people realize the part played by atmospheric conditions in creating and continuing skin irritation. A hot environment increases skin temperature, which in turn increases skin irritability. Profuse sweating irritates the skin and makes it more alkaline. Alkaline materials remove much of the fatty substances of the skin and greatly reduce its natural protection. Many cases of dermatitis are made worse by the use of abrasive hand cleansers and strong alkaline soaps.

### *Accidents*

Industrial accidents cause much suffering and hardship to workers and great financial loss. During 1930, according to the report of the Workmen's Compensation Board of Ontario, 1,265 out of every 10,000 full-year workers in that province were injured. The causes of industrial accidents might be tabulated as primary and secondary, the primary cause being the physical agency directly responsible for the injury, while the secondary cause runs the gamut from individual ill-being to advanced psychosis. Perhaps there impinges the factor of individual susceptibility, for we are reliably informed that 70 per cent. of the accidents occur in 25 per cent. of a given group of workers.

For present purposes, accidents may be divided roughly into three classes: (a) purely fortuitous or accidental in the popular sense; (b) from exogenous instrumentalities of a human nature; (c) from endogenous causes such as speed of movement, keenness of perception, muscular co-ordination, mental adaptation, general intelligence and physical well-being. Control of industrial accidents must take cognizance of the personal factor. This has not been generally recognized. Its immediate application lies in the provision whereby workmen sustaining two, or at the most three, even minor accidents in a unit of time, should be removed to a less hazardous occupation.

### *Specific Poisons*

Wherever these substances are used, it is necessary to come to some definite

conclusion as to whether their use is attended by serious consequences to the workmen. In all cases a primary evaluation is made, when it should be decided whether or not analyses of materials, dust counts, and complete medical examinations are necessary.

#### THE FIRST INSPECTION OF THE PLANT

##### *The Company's Attitude*

On inspecting a plant, the first person met is usually the manager or superintendent. At this meeting the company's attitude towards the health of its employees is ascertained. Frequently the blame for any occupational disease is placed on the shoulders of the worker. The statement is made over and over again that the men do not wash, that they stay up late at night, drink or have some other bad habit to which their ailment can be attributed. Remarks of this kind from the man in charge makes one suspicious that trouble has been experienced in the plant and that no action has been taken to find the cause.

It is of importance to know that most industrial diseases are produced by the introduction into the body over a long period of time of relatively small quantities of toxic materials. Hence their onset is usually slow and insidious, and not spectacular like "poisoning" in the popular sense of the word. Some people are much more prone to be affected than others by the same exposure, but unfortunately there is no way to anticipate individual susceptibility. Thus it is not reasonable to conclude, because all the workmen exposed are not affected in the same way and some not at all, that those complaining are not suffering from an occupational disease. In some plants where a definite hazard exists one is told that they have been operating ten to fifteen years without trouble. This may be possible, because, very often, occupational diseases have not been and are not recognized as such, or labour turn-over is so high as to prevent sufficient exposure. This argument in some cases is used to discourage further investigation. It is hard to believe that any manager or superintendent with several years' experience handling poisonous materials would never have seen a case of poisoning. Some few employers even deny the existence of industrial diseases.

##### *The Workmen*

From conversation with the workmen much valuable information is obtained. A fairly accurate knowledge of the labour turn-over in the plant can be obtained and whether this measure is being used to prevent the occurrence of occupational diseases. A rough idea of the time lost and the most prevalent causes of sickness is also determined. If a worker complains of ill health, detailed questioning regarding his complaint is of great value. Very often the worker will blame his occupation for his ill health when it is due to other causes. This tendency to attribute ill health to causes beyond one's control is not common to the workingman only, but pervades all groups in the community. The general appearance of workmen is worth noting. Do they look undernourished as a class? Do they appear pale and anaemic? Generally speaking, the older

the worker the better he is able to withstand industrial poisons. Females are most susceptible to serious damage than males. If the nature of the work is heavy, one has to bear in mind that more air will be breathed than at a sedentary job. This is very important if a dust or fume hazard exists, as the injurious materials entering the body will be greatly increased in amount.

#### *Are Poisonous Materials Used?*

It is not generally appreciated that a great many industrial plants, both large and small, do not know the chemical nature of the materials in use. This statement appears startling, but on further consideration it can be understood, as industry is largely concerned with "performance" rather than with chemical composition. A large firm may decide to start doing its own paint spraying. A spray booth is obtained and the necessary selection of paints and lacquers is made. In this selection the colour, viscosity, drying time, durability of finish and cost will be considered, while no reference is made to the chemicals used in the finish. If it is a paint, it may contain lead or silica; if it is a lacquer, it may contain benzol, lead or some other injurious ingredient. The first intimation this type of a plant usually gets concerning the chemical composition of its paint or lacquer is when some workman becomes sick, or an inquisitive factory inspector has asked questions concerning the materials used. Even in plants with laboratory facilities the chemical knowledge of materials is largely confined to the laboratory. Another source of hazard in industries using paints and lacquers is the substitution of "just as good" an article. Very often as far as performance goes this substitute is just as good as the original, but its cost is reduced by using a cheaper substance, perhaps cheaper partly because it is poisonous. It is familiar to everyone that a great deal of material is bought under trade name, a name that very often in no way indicates the composition. Seldom are these preparations labelled as to poisonous contents.

In seventeen plants all making similar products in which was suspected the use of a volatile poison, only three of them had any knowledge whether they were using, might use, or had used this poisonous material. From these plants alone there could have been collected enough samples to keep a chemist busy for a year. Fortunately, however, from close attention to the particular process, verbal examination of the workers and the information gained from the three plants knowing what they were using, coupled with analyses of a limited number of samples, the hazard for the whole group was estimated. Most of the spectacular and serious occupational cases occur in plants where the workmen and executives alike are ignorant of the poisonous nature of the materials used.

#### *Nature of Process*

If poisonous materials are used, the type and nature of the process greatly influence the danger. Ordinarily processes may be divided into open, closed or partially closed. The ideal method of handling poisonous materials is to use a closed process, but this is not always practicable. Even with a closed process a degree of hazard exists when the materials are put in and taken out, and when

the process machinery is cleaned. This cleaning may be very hazardous. Entry into an enclosed space of any kind is not without considerable danger unless proper precautions are taken. In open or partially closed processes there is always some hazard when poisonous materials are used. This hazard can be greatly reduced, but never entirely eliminated, by the use of efficient exhaust systems. Although wet processes naturally do not produce as much dust as dry ones, the advantage may be lost by the unfavourable influence of dampness on the incidence of tuberculosis, pneumonia and rheumatism. Dry grinding and mixing may be the cause of considerable dust, and hand sorting of scrap lead is usually very hazardous. The use of pneumatic tools is very often accompanied by the production of large amounts of fine dust effectively scattered about by the air exhaust on the tool.

The inhalation of poisonous dusts or fumes is the most common cause of industrial poisoning. From this it can be readily understood that the control or prevention of industrial diseases depends primarily upon the employer, rather than upon the personal hygiene of the worker.

#### *Silica and Lead Dusts*

While all dusts may be more or less injurious, the chief offenders are silica and lead. In the case of silica dust it is the particles under ten microns in size that cause the trouble, entrance being gained through the respiratory tract. In lead much of the coarse dust is swallowed and absorbed by the intestinal tract, the fine dust entering the body by way of the lungs. It is reasonable to assume that if visible dust is present, fine dust is present also. But if no dust is visible this does not mean that no fine dust is present in the air. Generally speaking, it is dust of a size seen in a beam of sunlight which is most important. Control of visible dust is not difficult. Control of invisible dust is extremely difficult, if not impossible in some cases, because it must be recognized that in addition to dust of visible size and even of ultra-microscopic size there are dust particles so infinitesimal as to be incapable of human measurement. Even the grinder working at a slowly revolving natural grindstone kept continuously wet with a stream of water produces enough dust to cause trouble after many years of exposure.

A common way to ascertain the presence of invisible dust in a process is to take dust accumulations from rafters, sills, etc., near the process. If this contains the poisonous materials used in the factory it is reasonable to assume a hazard. In making a survey in a lead plant, samples of a fine dust were obtained from the locker tops in the washroom. This washroom was in a building by itself located several hundred feet from the workshop. The dust on analysis contained 12 per cent. lead. Here was a lead hazard in a place where no lead was thought to be present. It is essential that people using poisonous materials keep their places clean. Housecleaning is usually the first step taken in making a plant safe. Expensive exhaust systems are of relatively little value if fine dust is permitted to remain on places of lodgement. The constant vibration of machinery and the movement of materials on the floors will continuously



stir up this dust, creating a maximum hazard from a minimum amount of dust. It is the size of the particle, rather than the weight, that determines the rate of settling of fine dust. The smaller the particle the bigger is its surface in relation to its mass. The use of machinery has greatly increased the dust hazard, especially in trades like granite cutting, where pneumatic tools have displaced the hand hammer. The means of keeping dust down by mechanical methods have not kept pace with its production by machines.

### *Poisonous Fumes*

Next to dust as a cause of industrial diseases come poisonous fumes. Fumes or vapours are very readily absorbed through the respiratory tract. This can be understood, as the lungs are highly specialized organs for the exchange of gases to or from the body. Lead, benzol, and nitrous fumes are commonly encountered in industry. Lead fumes are given off by molten lead at a high temperature. The control of the temperature of the lead will control the fume hazard to a great extent, but will not prevent the dust hazard produced by the formation of lead oxide on the top of the molten metal. Nitrous fumes are relatively insoluble in water and, compared with many others, are less irritating. They reach the air sacs of the lungs with little warning and there produce an intense inflammation leading to pulmonary oedema and usually death. The first sign of any trouble comes from twelve to forty-eight hours after exposure to the fumes. On account of this delay the real cause is often obscured and, indeed, seldom recognized, so that very few cases of poisoning by nitrous fumes are brought to our attention. Gases like chlorine and sulphur dioxide, while very poisonous, are so irritating that they are practically irrespirable in toxic concentrations. Hydrogen sulphide, the aroma of which pervades most chemical laboratories, is about as toxic as hydrocyanic acid gas in high concentrations and can be evolved from many organic materials. This gas is the common cause of fatal poisoning in sewers and sewage disposal plants.

High concentrations of benzol vapour, like high concentrations of the vapours of toluol, gasoline, ether, chloroform and many other solvents when breathed, cause anaesthesia, and even death. But the concentration required to produce this sudden effect is not ordinarily encountered in industry, and when it is encountered the nature of the happening is more like an accident than an occupational disease. It is continued exposure to small amounts which constitutes the major industrial hazard. Men daily exposed to a concentration as low as 100 parts of benzol vapour per million parts of air are very likely to show some blood changes. Most of the cases of benzol poisoning coming to our attention, however, have been caused by concentrations in excess of this amount. In one case where the exposure was very small it took ten years to produce fatal results. In evaluating a benzol hazard one must bear in mind that it is the continued use of benzol, even in small amounts, that is likely to cause serious trouble, and not the occasional use of larger amounts. Thus a painter who uses paint remover, which usually contains benzol, does not get into trouble if his exposure is limited to this source. In factories, however, it is very difficult in some cases to draw the line between continued and occasional use.



It is not necessary to assume that the use of poisonous materials in industry is bound to produce dire results, for this need not be the case. There are a great many plants in Ontario where poisonous materials are used without any known serious consequences, but these plants realize what they are using and adopt adequate methods of control. The most serious and spectacular cases of occupational diseases usually occur in plants where poisonous substances are used unknowingly or carelessly.

#### *Control of Occupational Poisoning*

It may be emphasized again that while a considerable number of substances produce skin irritation among wage-earners, the most important occupational diseases are produced by the inhalation of dust and fumes. The general measures adopted for their control must therefore rest with the employer rather than with the employee. They consist of:

- (1) The substitution of less poisonous for dangerous materials, such as occurs in the use of zinc oxide or titanium oxide in place of lead for outside paints; or the partial substitution of toluol for benzol as a solvent or diluent.
- (2) The labelling of containers holding materials such as lead or benzol, by manufacturers and distributors of these materials, so that employers may know that these substances are being used.
- (3) The provision of local exhaust ventilation to remove dangerous substances from the atmosphere at their source. This is the most important single measure for control.
- (4) The use of water or oil, which are limited in their application and do not usually entirely remove the hazard.
- (5) Periodic examination of workers known to be exposed, in order that early symptoms and signs of poisoning may be recognized and the workman removed from exposure before disability arises.

#### *Control Measures for General Sickness*

While the specific occupational diseases are important, the loss in time and disability which they produce is a small part of that due to general sickness, to which all are subject. It is estimated that general sickness accounts for about six days' lost time per worker per year while industrial accidents are responsible for about one and a half days, so that a reduction of 25 per cent. in lost time from general sickness would be equivalent, from this standpoint, to the total elimination of industrial accidents.

General sickness is characterized by the fact that nearly one-half is due to diseases of the respiratory system, 20 per cent. to diseases of the digestive system and 10 per cent. each to the rheumatic group and those of the circulatory system; one-half of this lost time is due to illness of less than seven days' duration; female workers show about 50 per cent. more lost time from sickness common to both sexes; least sickness occurs around twenty-five years of age with a gradual increase thereafter; marked variations occur in the experience with sickness from one factory to another, even when the same product is manufactured.

Efforts directed to the control of general sickness involve the employment of medical personnel under conditions where physicians, nurses and first aid workers bear some direct responsibility to industry. For factories in this country, these physicians will be mainly on part-time duty and therefore the work must be conducted by the general practitioner. Sometimes it is practical for one physician to supervise health in a group of small plants readily accessible to one another.

Since the specific means for the control of adult ill-health are limited to such procedures as inoculation against typhoid and vaccination against smallpox, the main measures depend upon recognition of disease in its early stages, so that appropriate advice may be given and treatment carried out by the family physician, if this is necessary.

The first and most obvious measure for control of ill-health is the supervision of first aid in both accidents and sickness. While very serious accidents occur in industry, so that employees generally should be trained in first aid, the most important single item in first aid is the adequate care of wounds to prevent infection. In most cases, this is a comparatively simple procedure when suitable first aid facilities are available including trained personnel under medical direction. Yet the number of wound infections is still high.

By first aid in sickness is meant attention to minor complaints of ill-health. This provides an opportunity for the early diagnosis of disease. When confidence in health supervision has been established, workmen will use this service when they would not incur the expense of a visit to the family physician.

Physical examination on employment should be conducted with a view to determining what diseases or defects are present in order that they may be given consideration in choosing suitable work for the applicant. Except where special hazards exist, the number of rejections should be low, confined to those with such conditions as active tuberculosis, gross heart disease and perhaps epilepsy, or other conditions which require active treatment. Physical examination in industry should be used for the control of ill-health and not as a means for excluding from employment. Periodic physical examination provides an additional opportunity for the early diagnosis of disease and should be applied after an illness and before return to work; if disease or defect has been suspected in a previous examination; before transfer from one job to another of different type; or when partial failure at work suggests ill-health as the cause of it.

The opportunity for health education is important. The example provided by executives of a factory acting on advice arising out of health supervision, influences the individual workman both at the plant and in his attitude to health education for his family at home. Discussion of health habits of employees in the light of a recent physical examination is much more effective than any abstract discussion of health before large groups. At the same time, groups of employees may be addressed on the subject of health with advantage.

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## STAPHYLOCOCCAL FOOD POISONING

THE publication in this issue of reports of two outbreaks of food poisoning due to the contamination of the products with toxin-producing strains of staphylococci draws attention to a problem the extent of which comparatively little is known. Attention was first drawn to the subject by the studies of Barber, who isolated a strain of *Staphylococcus albus* from milk which had occasioned gastro-enteritis in several persons in the Philippines. He established the fact that this strain of staphylococcus was the cause of the illness by drinking milk in which the organism had been inoculated and allowed to grow. It was not, however, until Dack and his co-workers showed in 1930 that a strain of yellow haemolytic staphylococci was responsible for an outbreak of food poisoning involving eleven persons that attention was given to the findings of Barber. Following closely on these studies, Jordan and his associates reported similar observations of food poisoning due to staphylococci, establishing by extensive feeding experiments in human volunteers its etiological relationship. Dennison, in reviewing the subject in October 1936, recorded the occurrence of eighteen outbreaks, and during the past two years data concerning other outbreaks have been published. Meyer, in reviewing the histories of food poisoning in California and Washington in 1936, was of the opinion that staphylococcal food poisoning occurred much more frequently than was believed. Fifteen single or mass intoxications were investigated by him, and in addition eight other outbreaks in which the nature of the food article involved, sympatomatology, and epidemiological evidence strongly suggested staphylococcus toxin as the factor. Although the food products involved in twenty of the outbreaks were cream- or custard-filled, two outbreaks were due to meat sandwiches and headcheese, and one to salted herring.

The epidemics that have been recorded are sufficient to indicate that many cases of illness with gastro-intestinal symptoms are due to such food poisoning. Many persons suffer illnesses, particularly during the summer months, who are not seen by physicians. It is difficult, therefore, to know how many cases of food poisoning occur in the community and the extent of staphylococcal food poisoning.

The fifty or more cases reported by Doctors Cogswell and Kilbourne and Miss Kuhns in Billings, Montana, add further evidence that custard- and

cream-filled cakes afford a particularly favourable medium for the development of staphylococcus enterotoxin. The majority of the recorded epidemics have been associated with such products.

The outbreak in Hamilton, Ontario, was of similar origin. This study is of particular interest because it is one of the first outbreaks in which the epidemiological and laboratory studies have been sufficiently complete to establish the source of the infection. Strains of *Staphylococcus aureus* capable of producing enterotoxin were isolated from the noses and throats of certain members of the bakeshop staff and from a pustule on the finger of one member.

There is every reason to believe that the occurrence of such cases of food poisoning due to staphylococci can be traced to contamination of the food product by the discharges of the nose and throat or by lesions on the hands of those preparing the food. The situation calls for action on the part of municipal authorities. Adequate inspection of bakeshops by competent sanitary inspectors will do much to improve the sanitary conditions. Regulations concerning the preparation of custard and cream fillings, including proper cooling, the use of sterile filling apparatus, the wearing of cotton gloves, and the refrigeration of the filled products, are desirable. It is realized, however, that no amount of inspection can eliminate the possibilities of human contamination. Further, the attempt to safeguard such food products by requiring refrigeration during their distribution and sale cannot be considered practical. In a recent study, Dack, Stritar and Jungwaelter reported that by reheating custard-filled puffs and éclairs in the bakeshop, after filling, for a time and at a temperature sufficient to kill staphylococci, does not impair the flavour or the appearance of the product. This method, if properly carried out, may prove to be of value in the case of certain confections. It would seem, however, that the prohibition of manufacture during the warm months of the year is the most satisfactory procedure.

In emphasizing the occurrence of staphylococcal food poisonings, the occurrence of other illnesses following the consumption of contaminated food due to the presence of members of the *Salmonella* group must not be overlooked. Recent studies have shown the widespread distribution of strains producing acute infections, particularly during the summer months. The development of a laboratory test by Dolman has made possible the identification of staphylococcus enterotoxin. This important contribution has facilitated the studies of staphylococcal food poisoning, as indicated in the study of the strains isolated in the Hamilton outbreak.

As previously stated, the extent of such food poisonings is not known. There is urgent need that health departments be advised by physicians of the occurrence of acute illnesses with gastro-intestinal symptoms so that immediate investigation may be made. There should be no hesitancy on the part of any department of health to publish the data concerning any outbreaks. The public must be informed concerning the possible danger of such food poisoning during the summer months, and departments of health must be prepared to take active measures for the safeguarding of the public.

# REPORT OF THE ASSOCIATION'S WORK DURING 1937\*

## Part I

### REPORT OF THE HONORARY SECRETARY 1937-1938

IN presenting this, the twenty-seventh annual report of the Secretary of this Association, I want to say briefly that your executive officers have presumed to carry out the expressed wishes of Council in all matters referred to it by that body. They have attempted, in other matters which have during the year required their consideration, to discharge their responsibilities in what has appeared to be in the organization's best interests. To those of us who have been privileged for some years to give direction to those previously-mentioned interests, this year has been one of resumed progress. By the term resumed progress, I do not wish to imply that progress was not made last year or the year before, but some of you will recall that in 1936 and in 1937 your Secretary's report contained an importuning note and there was a feeling of concern as to the Association's immediate future; not the ultimate future but that associated with the months immediately ahead. This feeling of undue concern has been dissipated and your Executive Committee has certain recommendations to make to this Council which it is hoped will place the Association more firmly on the way to the realization of those objectives which have not yet been reached, but which seem infinitely nearer of approximation than they have been heretofore.

I can recall without effort the time when the reports of the General Secretary and the Treasurer were the only media for presenting to the Executive Council and the Association the activities of the Association during the year under review; but, to-day, there is little for the Secretary to report. The Association's program and accomplishments require a 72-page volume, and the reports of the various groups who have assisted your elected officers in the conduct of your affairs, give in detail the extent of such activities.

Our financial position would appear to warrant the program of justifiable expansion which has been the goal of members of Council even as far back as I can officially recall, and which will be later presented for your consideration.

The continued success of the *Journal* and its general acceptance as the logical medium for formal presentation of the contributions of those engaged in the various aspects of community health and preventive medicine in Canada are commented on in detail in the report of the Editorial Board.

The success which has been attained in our efforts to aid those who for some years had manifested a concern in the improvement of the status of that

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\*Presented at the annual meeting of the Executive Council of the Association, held in Ottawa on June 14, 1938.

essential auxiliary to a functioning health officer, the sanitary inspector, has been greater than hoped for and is recorded in the report of the Committee charged with that responsibility.

While the program of the Section of Public Health Nursing was not carried to the point anticipated by the officers of that section, it was due not to a diminution of interest but to circumstances beyond the control of those concerned. On the other hand, the Section of Vital Statistics and Epidemiology has continued to function effectively not only as an active agency but as a stimulus to official and other voluntary agencies. The Laboratory Section is now firmly established as the organization representing all those engaged in this essential field of public health effort. The unqualified success of the mid-year meeting, again held in Toronto, on December 20th to 22nd, might rightly be considered as an index of the accomplishments of this subdivision of the Association's membership.

Some publicity has been given to the extraordinary response of those responsible for the direction of county health units in the various Provinces to the invitation jointly extended by the American Public Health Association and the Canadian Public Health Association to participate in the Rural Health Conservation Contest, which has for some four years been sponsored by the American Public Health Association with funds made available by the Kellogg Foundation. The details of the contest are to be found in the report of the appropriate committee.

The report of the Committee on Archives contains the names of many of those who, while not manifestly prominent in the Association's affairs, yet contributed to its success. The cause of public health suffered a great loss in the passing of the Hon. Wm. F. Roberts, M.D., Minister of Health and Labour for New Brunswick. The Hon. Dr. Roberts laid the foundations for the progress of public health in New Brunswick and contributed generously to the advancement of public health throughout Canada.

Formal recognition was again extended to those who have contributed substantially to the success of public health in this country and the United States. The names of those receiving honorary membership were Dr. Helen MacMurchy, formerly Director of the Division of Maternal and Child Hygiene, Department of Pensions and National Health, Ottawa; Dr. John A. Ferrell, Associate Director of the International Health Division of the Rockefeller Foundation, New York; and Dr. George F. Buchan of London, England.

Reference has on occasion been made to the amount of clerical work essential to the conduct of this organization. It is safe to presume, however, that few realize the amount of such work actually required. The attached statement, which presents the amount of correspondence passing through the hands of the administrative staff, is an index of the amount of time necessarily expended by one or other of the officers giving the required direction to the affairs of the Association.

I wish to bring this, my fifteenth annual report, to a logical conclusion by commenting on the further manifestations of support which we have received from the Canadian Life Insurance Officers Association by the generous grant of

#### OUTGOING MAIL, JANUARY-MAY, 1938

Letters: General .....	1,679	Copies of Field-Work Report for Sanitary Inspectors .....	44
Relating to the certification of sanitary inspectors .....	501	Copies of announcement of 1938 examinations for sanitary inspectors ....	171
Total .....	2,180	Copies of preliminary program, twenty-seventh annual meeting .....	3,843
Copies of news letters to members ....	2,855	Copies of program, conference of the Vital Statistics Section .....	193
Postcards .....	245	Copies of exercise on medical certification for use of undergraduate medical students .....	332
Invoices and receipts .....	1,190	Copies of experimental stillbirth-registration form for use in hospitals	802
Single copies of the <i>Journal</i> .....	688	Reprints, single copies .....	26
Sets of Syllabus and other literature relating to the certification of sanitary inspectors .....	346	Reprints, parcels .....	22
Copies of the Manual for Sanitary Inspectors .....	43		

\$2,000 and again to pay tribute to the extraordinary enthusiasm on behalf of the Association continuously shown by Dr. R. D. Defries, and the interest exhibited by Mr. Randall, whose capable conduct of much of the office routine makes the Association's continuance possible. The resignation of Dr. C. P. Fenwick as Honorary Treasurer of the Association was reluctantly accepted by the Executive Committee. Dr. Fenwick has served as Honorary Treasurer for eight years. The Executive Committee have formally expressed to Dr. Fenwick their appreciation of his services.

J. T. PHAIR, *Honorary Secretary.*

#### REPORT OF THE HONORARY TREASURER

THE accounts of the Association for the year ending December 31, 1937, have been duly audited and are presented herewith. I am pleased to be able to report that the Association's income was substantially increased during the year. The total revenue amounted to \$9,082.15, in contrast with \$7,403.13 in the preceding year. A grant of \$1,000 made by the Dominion Government to the Association on the occasion of the holding of the annual meeting in the city of Ottawa and an increase in the grant generously made to the Association by the Canadian Life Insurance Officers Association largely accounted for the increased revenue. In view of the deficit in the preceding two years, every effort was made to curtail the expenditures; but further expansion of the Association's activities resulted in a net increase in expenditure of approximately \$300.00. In spite of the increase in printing costs, the expenditures for the publishing of the *Journal* were only \$100.00 greater than last year. It is



unnecessary to state that the publication of such an important journal for approximately \$5,500.00 is possible only because of the amount of voluntary service generously given to the Association by the Chairman and members of the Editorial Board. The advertising revenue of the *Journal* has remained practically constant and there has been a gratifying increase in the revenue from subscriptions, representing approximately a net increase of 6 per cent.

One of the major undertakings of the Association is the holding of the annual meeting, constituting a national public health convention. In order to meet in part the expenditures of such meetings, the plan has been followed of arranging for commercial exhibits and of charging a registration fee. The registration fee was first charged at the Vancouver meeting in 1936. This plan was again followed this year. Supplementing these sources of revenue, the Province of British Columbia made a grant for the Vancouver meeting and the Dominion Government a grant toward the Ottawa meeting. As a result, the annual meeting held in Ottawa, which was so largely attended and proved so successful, was convened without expense to the Association.

CANADIAN PUBLIC HEALTH ASSOCIATION  
REVENUE ACCOUNT

Schedule A

FOR THE YEAR ENDED 31ST DECEMBER, 1937

*Revenue*

Advertising .....	\$3,036.50
Subscriptions .....	3,159.44
Sanitary Inspector's Section .....	331.63
Profit on Reprints .....	9.58
Canadian Life Insurance Officers' Association—Grant .....	1,500.00
Dominion Government—Grant .....	1,000.00
Bond Interest .....	45.00
	<u>\$9,082.15</u>

*Expenses*

Printing .....	\$4,220.50
Postage on Magazines and Mailing Cost .....	774.84
Commissions .....	519.42
Advertising and Promotion Expense .....	140.75
Cuts and Sundries .....	85.60
Honoraria .....	573.00
Salaries .....	347.13
Annual Meeting Expense .....	342.18
Stationery and Office Supplies .....	315.62
Postage and Telegraph .....	225.35
Laboratory Section Expense .....	141.13
Vital Statistics Section Expense .....	2.47
Public Health Nursing Section Expense .....	1.64
Miscellaneous Expense .....	98.45
Bad Debts written off .....	6.68
Reserve for Depreciation—Office Equipment .....	7.63
Discounts Allowed and Bank Exchange .....	71.90
	<u>7,874.29</u>

Profit for the year transferred to Surplus Account .....	<u>\$1,207.86</u>
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After having made frequent reference in previous reports to the necessity of salaried office assistance it is a pleasure to record that it was possible for the Association to employ an office assistant for the last six months of 1937. There is every reason to believe that from now on the Association will be able to provide for such service. The volume of office work has so steadily increased that such assistance is essential.

The publication of the reports of the Association, constituting a volume of more than 75 pages, is sufficient evidence of the extensive work conducted by the Association. For 28 years the Association has carried forward its activities without salaried officers and with practically no office assistance. The work has been made possible by the members assuming responsibilities and through their hearty co-operation in doing the work requested of them. The time has come, however, when the Association must give earnest consideration to the provision of adequate office arrangements and if possible, a salaried executive officer. It is my understanding that such plans will be presented at this annual meeting.

BALANCE SHEET  
AS AT 31ST DECEMBER, 1937

Schedule B

*Assets*

Cash on hand .....	\$ 130.51	
Cash in Bank .....	2,210.53	
Accounts Receivable—Advertising .....	\$434.80	
Subscriptions .....	303.92	
Reprints .....	109.05	
Miscellaneous .....	64.00	
Total .....	\$911.77	
Less: Reserve for Doubtful Accounts .....	37.35	874.42
Deposit with Postmaster .....	15.00	\$3,230.46
Province of Ontario Bonds—4½%, 1949		
Par Value \$1,000.00—Cost .....		1,012.50
Canadian Public Health Journal .....	1,000.00	
Office Equipment .....	76.34	
Less: Reserve for Depreciation .....	14.63	61.72
		<u>\$5,304.68</u>

*Liabilities*

Accounts Payable .....	\$1,360.31
Prepaid Subscriptions .....	358.12
Accrued Commissions and Expenses .....	50.12
	<u>\$1,768.55</u>

*Surplus:*

Balance as at 31st December, 1936 .....	2,328.27
Add: Profit for the year (see schedule A) .....	1,207.86
	<u>3,536.13</u>
	<u>\$5,304.68</u>

Referred to in our report of this date attached.

TORONTO: 10th February, 1938.

GRAY, TESKEY, AND HILL,  
Chartered Accountants.

I wish to record again the appreciation of the Association for the valued support of the Canadian Life Insurance Officers Association as expressed in a grant of \$2,000.00 made toward the work of the Association during the year. Of this amount, \$1,500.00 was paid during the fiscal year of the Association. This interest and support has encouraged the officers to make plans to meet the enlarged work of the Association.

I have expressed in former reports my opinion that the Association should again present its work to the Dominion Government, seeking financial support as the work of the Association is national in character and essential to public health progress in Canada. It is not possible for the Association to continue to conduct such extensive work and undertake further responsibilities without financial assistance.

The Association has again been accorded office space and other facilities by the Health League of Canada; this generous assistance has been greatly appreciated. The Association is indebted also to the Department of Health of Ontario, and the School of Hygiene, University of Toronto, for many helpful services and for their continued manifestation of interest.

In concluding my report, I wish to express my appreciation of the work of Mr. Frederick Surphlis in connection with the duties of the Treasurer's office and of the services of Mr. William Nichols who was appointed on the retirement of Mr. Surphlis in October.

C. P. FENWICK, *Honorary Treasurer.*

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#### REPORT OF THE EDITORIAL BOARD

IN 1928 the Association assumed the responsibilities of the editing and publishing of the *Canadian Public Health Journal*. This, therefore, is the tenth report of the Editorial Board. Since this annual meeting of the Association is to consider recommendations of the Executive Committee in regard to plans for facilitating the Association's work, it is opportune to review in this report the present undertakings of the Editorial Board.

During the past year twelve issues of the *Journal* were published, the volume consisting of 626 pages. In each issue five or six leading articles were published, making a total of seventy-four, together with abstracts of twenty-five papers presented at the Christmas meeting of the Laboratory Section. Twenty editorials were prepared and more than forty pages were devoted to presenting activities of the Association such as the annual meeting, the rural health conservation contest, etc. Special sections presenting brief reports of various departments of health, the occurrence of epidemics, and reports of meetings, with comment on various matters of public health interest, appeared on ten occasions. During the year the Board again had the pleasure of publishing the quarterly Letter from Great Britain which has been generously contributed by Dr. George F. Buchan of London, during the past six years.

In connection with the outbreak of poliomyelitis in Ontario, the *Journal* facilitated the publication of the papers presented in the symposium at the Academy of Medicine, Toronto, on September 7th by re-arranging the September issue so that they might be included. These papers were subsequently added to the Reprint Series. Copies were also made available by the Department of Health of Ontario to all physicians and the reprinting was greatly appreciated by the Department. In the November issue the report of the study of the trial of the prophylactic nasal spray, as conducted in Toronto, was published.

Plans were made for the publication of the series of articles on the development of public health in the various Provinces and in the Federal Government. The publication will be an important addition to the Reprint Series, constituting a volume of approximately one hundred and fifty pages. The recording of the history of public health in this manner by those who were familiar with its development will be a most important contribution to Canadian medical history. The financing of this publication will, it is hoped, be possible through the distribution of copies to the departments of health.

In view of the marked interest in the two Milk Numbers of the *Journal*, one of which was made available in the Reprint Series, a third Milk Number was planned for the June issue.

During the year the Board has been responsible also for the editing and publishing of the Manual for Sanitary Inspectors as issued by the Committee on the Certification of Sanitary Inspectors. The Manual has been prepared in mimeographed form, consisting of more than two hundred pages. Similar service has been rendered to the Laboratory Section in the preparation of the Section's Bulletin.

For the year ending December 31, 1937, the average monthly circulation of the *Journal* was 3,125 copies. The circulation has been audited annually since the Association assumed the control of the *Journal*, the *Journal* being the first of the medical journals in Canada to have such an audit made. Supplementing the audit, the Association presents an analysis of the circulation showing the number of physicians, public health nurses, libraries, etc., receiving the *Journal*, as well as the circulation by Provinces, foreign circulation, etc. Approximately two thousand physicians receive the *Journal*. The analysis shows that at least one physician in every municipality in all the Provinces where health services are arranged through local municipalities, receives the *Journal*. Such a wide distribution is possible through the co-operation of the provincial departments of health in enrolling as members all physicians serving as medical officers of health. This co-operation is greatly appreciated and has made possible the continued publication of the *Journal*. The opportunity of the *Journal* to present the practice of preventive medicine therefore needs no emphasis.

Reviewing the list of similar scientific journals, one is impressed by the fact that almost all are either endowed or charge a subscription fee of five dollars or more. Your Editorial Board has had to assume the editorial direction and at

the same time be responsible for meeting the entire publication costs. Further, the Board has had to assume all of the detailed work associated with maintaining the circulation.

As presented in the Treasurer's report, the total publishing costs, including mailing charges, advertising commissions, etc., amounted to \$5,741.11. The revenue from advertising amounted to \$3,036.50 and from membership fees, \$3,159.44. Although publishing costs generally increased last year, the increased cost of the *Journal* amounted to only \$153.00. This highly satisfactory result was achieved through the strictest economy. The advertising revenue remained approximately the same as in 1936 while an increase of approximately 6 per cent. was recorded in the revenue from subscriptions.

To maintain the advertising revenue, efforts were made involving the sending on two occasions of detailed information, suitably displayed, to a selected list of three hundred national advertisers. The *Journal* was also presented personally by Major V. W. Dyas to advertisers in the leading cities. While many journals suffered a reduction in advertising revenue, it is gratifying that twenty-two companies or institutions were represented in the *Journal* during the past year.

When it is recalled that the entire work of the *Journal* has been conducted without salaried assistance for the past ten years, the need for the plans which are to be presented by the Executive Committee is appreciated.

As Chairman of the Editorial Board I wish particularly to record appreciation of the most valuable assistance given by Mr. Robert Randall in the editing and publishing of the *Journal*. Only the Board has knowledge of the amount of work entailed and the high efficiency with which Mr. Randall has discharged his responsibilities.

R. D. DEFRIES, *Chairman*.

# LETTER FROM GREAT BRITAIN

GEORGE F. BUCHAN, M.D., F.R.C.P., D.P.H.

*London*

## THE NURSING PROFESSION

**T**HE paucity of entrants to the nursing profession is causing considerable concern in Great Britain. The shortage is so acute that the London County Council have had to close down some wards of their hospitals on account of lack of nursing staff. As far back as 1932 the Lancet Commission on Nursing issued an extensive report on this question and recently a Government Interdepartmental Committee on Nursing Services has been set up "to enquire into the arrangements at present in operation with regard to the recruitment, training, registration and terms and conditions of service of persons engaged in nursing the sick and to report whether any changes in those arrangements or any other measures are expedient for the purpose of maintaining an adequate service both for institutional and for domiciliary nursing." This Committee is busily at work at the present time.

There is now a shortage of candidates of any type entering the nursing profession and this shortage becomes greater as local authorities extend their hospital accommodation. Many hospitals, too, have resolved to limit the hours of work of a nurse to forty-eight per week but have been unable to apply this principle on account of lack of nurses.

The main causes which contribute to the shortage of nursing candidates include:

(1) The fact that pupils on leaving school cannot as a rule begin and continue without interruption their course of study for nursing for tradition dies hard and it is still generally the opinion in this country that a girl should be at least eighteen years of age before she begins her nursing career. Not a large number of girls continue their education till eighteen and the conse-

quence is that many girls are attracted to other employment before the age at which they are at present accepted for nursing training.

(2) The exacting and harrowing character of the work probably deters a number of girls from seeking to enter the nursing profession.

(3) The training is long and arduous.

(4) The present conditions of training and service impose many restrictions on the probationer and on the qualified nurse.

(5) The ultimate salaries and prospects are not commensurate with the training and responsibilities of a nurse.

The remedy would seem to be to make the nursing profession more attractive and all the above points will require very careful examination and consideration. Probably an extensive rearrangement and development of training in all branches of nursing to meet modern conditions will be necessary. The age of entry is perhaps one of the most debated of the difficulties. To me it seems that every candidate should have a good general education and that then on leaving school at the age of sixteen she could well begin her training in a suitably organized scheme, qualifying as a fully-trained general nurse at the age of twenty.

The Interdepartmental Committee's report on the intricate problems involved, together with their solution of the difficulties, is awaited in this country with interest. I shall hope to give in a later letter a summary of their findings.

## THE MUNICIPAL MIDWIFE

THE domiciliary service of certified midwives to be available for attendance on women as midwives or maternity nurses is now in operation throughout England and Wales under the Mid-

wives Act 1936. Since the Act came into force the "lying-in period" has been extended from ten to fourteen days in a normal case of midwifery. This extension means the employment of a greater number of midwives.

The Minister of Health has now made regulations under the Midwives Act 1936 prescribing the qualifications of persons appointed by local supervising authorities to exercise supervision over practising midwives. The regulations prescribe qualifications for a medical and a non-medical supervisor. Two of the main features are that persons appointed in the future to act as supervisors of midwives must have had actual experience of midwifery practice and should possess the essential qualities of sympathy and tact. These latter qualities are somewhat difficult of assessment and would not appear to be virtues which only supervisors of midwives should possess.

The Central Midwives Board which controls the training of midwives was first established in 1902. It has adopted a progressive program in regard to training and on the 12th February 1937 the New Rules of Training and Examinations received the approval of the Minister of Health. The Board has been engaged in the preparation of this work for some years and hopes that it will be found adequate for the needs of the new domiciliary service.

The two most important changes which will be brought about as the result of the New Rules are (1) that the period of training will be extended from six to twelve months for a state registered general trained nurse and from twelve to twenty-four months for any other pupil midwife, and (2) that for each class of pupil midwives the course of training will be divided into two parts—a first period extending over six months for a state registered trained nurse and eighteen months for any other pupil and a second period extending over six months in all cases. Each period will be completed by an appropriate examination and a cer-

tificate known as the "First Certificate" awarded to a candidate successful at the first examination. This First Certificate will not entitle a pupil to admission to the Roll of Midwives or authorize her to practise as a midwife under the Midwives Acts 1902 to 1936. It will, however, be the recognized certificate for a candidate who desires to proceed to the training and examination for the post of Health Visitor. A candidate successful at the Second Examination will receive a certificate and be admitted to the Roll of Midwives.

It is also necessary for the institutions which desire to provide training for the First or Second Certificates, as well as the lecturers and teachers, to be approved annually by the Central Midwives Board.

The Minister of Health has recently issued Circulars and a Memorandum under the Act of 1936 in connection with the new training rules and the conditions upon which grants will be made by the Minister of Health in aid of midwifery training.

With regard to the grants, they are given primarily in order to maintain a full service of practising midwives and to assist a student who intends to practise as a midwife or to become a health visitor. The pupil must declare in writing her intention of either practising as a midwife or of completing a course of training approved by the Minister of Health for the training of a health visitor. The grants will be paid to recognized institutions only.

Grants will also be made in respect of practising midwives who attend post-graduate courses. It has been made obligatory on local supervising authorities to see that all midwives, who on or after 1st January, 1939, notify their intention to practise within their areas, shall attend residential post-graduate courses at least once in every seven years with a view to keeping up to date in modern theory and practice of midwifery.

The whole scheme for better mid-



wifery has been very carefully planned and every encouragement is given for its successful operation. Only experience will be able to tell us if the necessary number of midwives will be forthcoming and if their better training will reduce the maternal mortality rate which was one of the main objectives of the Midwives Act, 1936.

#### HOUSING AND DISINFESTATION BY CONTROLLED FIRE

THE housing of the working classes in England and Wales has proceeded with more or less orderliness since the subject became a prominent one at the end of the Great War. There have been quiet periods alternating with periods of great activity but this is to be expected when one considers the immensity of the problems involved, the principal drag to the wheel of progress in this (as in every other field of social service) being the cost.

Housing of the working classes is essentially uneconomic from the point of view of money and when public funds are required to subsidize the money recoverable as rent to finance a project, it is perhaps natural that progress should be slow. As a consequence of these apparently inevitable economic factors, the highest grade families of the working classes, *i.e.*, those whose financial circumstances are the most favourable, were the first to be re-housed in State-aided houses. As the needs of this grade became more or less satisfied, a lower grade was catered for by an increase of State subsidy or some other arrangement facilitating the production of low-rented houses, until in 1930 came the turn of the lowest grade, *viz.*, the slum dwellers. The provision of houses to combat the evil of overcrowding is being pursued concurrently with the abolition of the slums. Between 1920 and 1932, some 1,100,000 houses were erected with State assistance and it is probable that since that period the number has been increased to 2,000,000. Many more houses will be re-

quired to accommodate overcrowded families and this in itself is a complex problem involving re-planning of built-up areas in which the problems of traffic, noise and air pollution intrude.

The transference of families from slum and other undesirable properties to State-aided houses has brought into prominence what has been regarded as a minor housing problem although it is an important one, namely, the eradication of the bed-bug. The most potent agent for the destruction of bugs and their ova hitherto in use has been hydro-cyanic acid gas. Human life has been lost in connection with its use but the risks are being reduced as the technique is improved. Other agents which have been experimented with are orthodichlorobenzene, washed heavy naphtha and other coal tar distillates. Orthodichlorobenzene proved very effective to destroy the insect and the ova but was found to have a harmful effect on the operators and its use is now discouraged. Washed heavy naphtha has also proved very effective as a vermicide and it is not suspected of causing harm to the operators. When the technique used in its application is perfected it will probably become the most favoured vermicide in the campaign against the bed-bug. Sulphur dioxide is used by many local authorities with fair success in dealing with lightly infested dwelling-houses where the furniture remains *in situ*.

The usual methods in vogue at the moment in disinfesting the belongings of families proceeding to the State-aided houses is to fumigate the furniture by hydro-cyanide in a gas-tight chamber or a van en route to the new home. The bedding is usually disinfected by steam.

The infestations found in the structure of the house left behind and to be demolished are dealt with in various ways. In some cases heavy washed naphtha is used and in other cases sulphur dioxide is generated in the house. The newest agent used to prevent the dissemination of bugs from

the distribution of materials resulting from demolition is that recently employed by the Willesden Corporation, *vis.*, fire. The premises are set on fire under the control of the Fire Brigade and the heat generated destroys any bugs or ova which still remain on the premises. There is no doubt of the efficacy of the method but precautions must be taken to see that the fire is not allowed to spread.

#### POPULATION

THE Population (Statistics) Act 1938 was passed on the 30th March of this year and comes into operation on the 1st July. The Act has been passed because the rate of increase of the population in England and Wales is not maintained. No doubt the reasons for this are many and various and it is hoped that by means of the Act information will be forthcoming which may throw some light on the problem.

Section I of the Act states that with a view to the compilation of statistical information with respect to the social and civil condition of the population of Great Britain, every person giving information of any birth, stillbirth or death shall furnish confidentially to the Registration Officer:

#### 1. *On Registration of Birth or Still-birth:*

- (a) The age of the mother;
- (b) The date of the marriage;
- (c) The number of children of the mother by her present husband and how many of them are living;
- (d) The number of children of the mother by any former husband and how many of them are living.

#### 2. *On Registration of Death:*

- (a) If the deceased was a male, whether he had been married, and, if so, whether he was married at the date of death;
- (b) If the deceased was a woman and had been married:
  - (i) The year in which she was married and the duration of the marriage;
  - (ii) Whether she had children by her husband or any former husband;
- (c) The age of the surviving spouse, if any, of the deceased.

It is not easy to see exactly how this information will be helpful in solving the problem but in so far as the information to be provided is of a comparatively innocuous character, there is no good reason why it should not be readily given.

## PLANS, PROGRAMS, AND PROGRESS

### THE TWENTY-SEVENTH ANNUAL MEETING

THE twenty-seventh annual meeting of the Association was especially interesting in that it marked another important milestone in its vigorous development. During the past quarter of a century the Association's growth and its contribution as the national professional society of public health workers, have continued to reflect not only the support and interest of public health workers themselves, but the recognized need for a broadening and an intensifying of the present program. A step forward was signalled, therefore, in the enthusiastic endorsement by the Executive Council, and subsequently by the annual meeting, of plans presented to permit of the enlargement of the office staff and the appointment, as soon as the Association is able, of a medical secretary who would give attention to the problem of rural health services, conducting special studies. These developments will make possible a still broader field of activity and responsibility.

The Association's annual meeting, held in conjunction with that of the Nova Scotia Health Officers Association and collaterally with the sessions of the Canadian Medical Association and the Medical Society of Nova Scotia, was most successful. Despite the absence of many members on account of distance, the sessions were well attended and the discussions enthusiastic and productive. The members of the Local Committee on Arrangements, under the guiding hand of the President, Dr. P. S. Campbell, deserve to be congratulated for their work in making possible such an excellent meeting. Nothing can excel the courtesy and kindness of a Maritime welcome. The generous support of the meeting by the Provincial Government of Nova Scotia was greatly appreciated.

During the sessions, forty-three scientific papers were presented in addition to those contributed at the joint session with the Canadian Medical Association and the Medical Society of Nova Scotia. The genuine and general interest in the topics discussed was fully evident throughout. A special feature was the symposium on full-time rural health services, during the course of which the awards in Canada's first national rural health conservation contest were presented. The outstanding response throughout the Dominion to this first contest has been gratifying to the Association as well as to the W. K. Kellogg Foundation and the American Public Health Association, which jointly made the contest possible.

The presidential addresses of Dr. Campbell and Dr. de Witt both stressed the need for redoubled energy in the future and indicated the essential channels of further public health endeavour. The symposia on tuberculosis and poliomyelitis were of special value in presenting clearly the present status of our knowledge and activities in respect to these diseases both in so far as the public health administrator, the general practitioner and the specialist are concerned.

A special conference of the Section of Vital Statistics and Epidemiology was held in Ottawa on June 16th to make possible a full discussion of two important topics—a national stillbirth certificate and the confidential death certificate. The report of the Committee on Stillbirth Registration and Certification was adopted in full—including its suggestion for the scope and content of a single stillbirth form for national use. The problem of confidential certification produced wide discussion on the part of public health and insurance representatives. For the further study of this problem on a national scale a representative committee was appointed.

Two amendments to the Constitution were endorsed at the business session on the closing day of the conference, permitting the enlargement of the Executive Committee and the calling of the Executive Council at a time other than the annual meeting.

The successful outcome of the twenty-seventh annual meeting is further evidence of the increasing strength of the Association and of the general support of public health workers throughout the Dominion in the work which it is doing.

#### THE ANNUAL MEETING OF THE ONTARIO HEALTH OFFICERS ASSOCIATION

THE twenty-fourth annual meeting of the Ontario Health Officers Association was held in Toronto at the Royal York Hotel on June 1st, 2nd and 3rd. The meeting was attended by 430 health officers, representing one of the largest conventions that the Association has convened. A feature of the program was the provision of sessions for the discussion of problems of the medical officer of health in urban and rural centres. Dr. J. T. Phair reviewed the epidemiological findings and suggested administrative procedures based on the extensive epidemic of poliomyelitis last year. The subject of pneumonia was discussed from the public health standpoint by Dr. A. H. Sellers, Dr. A. L. McKay, and Dr. W. B. McClure. Of special interest to the members was the discussion by Dr. G. C. Brink of the significance of the 1938 legislation in the local tuberculosis program. The subjects of Protamine Zinc Insulin, the use of sulphanilamide, and Insulin therapy in the treatment of schizophrenia were also discussed. As anticipated, the recent legislation providing for the pasteurization of all public milk supplies received careful consideration. At the luncheon session on Monday, Dr. B. T. McGhie spoke on the training of personnel for local administration of public health as a re-

sponsibility of the Provincial Department of Health. At the annual dinner the Minister of Health, the Hon. Harold J. Kirby, made a brief reference to the subject which he had already presented to the Ontario Medical Association of the need for closer co-operation between the profession and the Provincial Department of Health. Dr. J. J. McCann, M.P. for Renfrew South and Medical Officer of Health, outlined the field of service of the Department of Pensions and National Health, Ottawa.

A resolution was passed urging that a definite basis of equitable remuneration for medical officers of health be established. A resolution was also passed urging the provision of refresher courses for health officers at strategic and convenient centres. A request was made also for the restoration of the former annual Provincial subsidy of \$500 in the appointment of public health nurses. The Ontario Government was asked to carry out an active program of education concerning the danger of raw milk. On the motion of Dr. T. H. McColl, the incoming President, a resolution was passed urging the Minister of Health to recommend the dismissal of any medical officer of health who fails to attend the annual convention for two consecutive years without being able to give a satisfactory explanation. It was felt by the convention that the annual meeting should be attended by every health officer in the Province. The attendance at this year's convention, while very satisfactory, represented only 430 of 700 health officers.

The officers elected for next year were: Dr. T. H. McColl, Tilbury, President; Dr. C. A. Warren, North York Township, First Vice-president; Dr. F. Ladouceur, Casselman, Second Vice-president; members of the Executive, Dr. H. B. Kenner, Stratford, Dr. J. E. Davey, Hamilton, Dr. G. B. Stalker, Hanover, Dr. W. E. Brown, Orillia, Dr. C. H. Bird, Gananoque, Dr. J. W. Mackie, Lansdowne, Dr. H. M. Young, Iroquois Falls, and Dr. J. C. Gillie, Fort William.

### VOLUNTARY SERVICES IN PUBLIC HEALTH

THE importance of services voluntarily rendered in the promotion of public health is being increasingly recognized. In public health nursing such voluntary services are of the greatest value, not only in the assistance rendered, making the nurses' work more effective, but in interpreting public health nursing to the general public.

Appreciation of the services of those who have assisted the Nursing Division of the Department of Public Health, City of Toronto, was expressed recently by Dr. G. P. Jackson, Medical Officer of Health. Dr. Jackson pointed out that 104 persons had assisted during the year and that 74 were at the present time giving

service in child health centres, schools, and district offices, to the extent of 85 half-days a week. The group included members of clubs and organizations, ex-public-health nurses, teachers, business women, and many others interested in giving community service. The value of such voluntary service was presented in an address by Prof. E. J. Urwick, President of the Welfare Council of Toronto.

### PERSONALS

ALBINI Jeannotte, B.A., M.D., D.P.H., has been appointed Medical Officer of Health of the city of Lachine, Quebec. Prior to this appointment, Dr. Jeannotte had served as Medical Director of the Temiscamingue County Health Unit since 1929.

## BOOKS AND REPORTS

**The Social Component in Medical Care.** Janet Thornton, Director, Social Service Department, Presbyterian Hospital, New York City. Columbia University Press, Columbia University, New York City, 1937. Xiv + 411 pages. \$3.00.

THE SOCIAL COMPONENT IN MEDICAL CARE is the result of a painstaking evaluation of the work of the Social Service Department of the Presbyterian Hospital in New York City. Although the idea that social factors have a significant bearing on health has long been recognized, the social aspects of disease have not been subjected to as thorough an exploration as have the physical ones. It has been with the hope of defining more clearly the part played by social influences in ill-health and in relation to curative medicine that the study which is embodied in this book was undertaken. The investigation covers 100 patients, and the information gathered in the case reports bearing closely on the individual medical problems presented by each patient, deserves study.

In those of the lower income groups,

which constitute 75 per cent. of our population, the gap between the treatment and regimen prescribed by the physician, and the practicability of carrying out the prescription, is a serious one. It is this gap which in many instances renders medical advice worthless. The problem is not solely one of an economic character, but one in which true social factors play an important role.

Physicians now have less opportunity and time to learn about, and therefore to consider, the home life of patients, than in the days when they visited patients largely in their homes. The progress which has been made in medicine, and the changes which have occurred in medical practice in recent years, have tended somewhat to make us regard patients as "cases" rather than individuals with disease. This report leaves no doubt as to the importance of adequately developed and directed social service departments in hospitals.

Of this book Dr. George R. Minot, Professor of Medicine at Harvard University, says: "If every physician and

medical student would read this book and utilize the information and thoughts set forth therein, medical care would be adequate and economical."

*A. Hardisty Sellers*

#### **Health Education of the Public.**

*W. W. Bauer, B.S., M.D., and Thomas G. Hull, Ph.D. W. B. Saunders Company, West Washington Square, Philadelphia, Pa., 1937. Canadian agents, McAlinsh & Co. Ltd., 388 Yonge St., Toronto. 227 pages. \$3.00.*

THE SUB-TITLE "A Practical Manual of Technique" expresses the purpose of this book. As Dr. Morris Fishbein says in the foreword: "The physician or the worker in the field of public health will find here the opportunity to accumulate in a short time knowledge which otherwise might be gained only with great difficulty and at considerable expense by the old system of trial and error."

Dr. W. W. Bauer, as Director of the Bureau of Health and Public Instruction, and Dr. T. G. Hull, as Director of Scientific Exhibits, have selected from their wide experience that information which the physician desires in presenting the subject of health to the public. They have appreciated that brevity is desired and only essential material has been included. The subject is presented in fifteen chapters, the volume containing 227 pages. Source of materials for adult health education, including books, magazines, state, federal and voluntary agencies are first given. Chapter three is devoted to radio presentation, including the three primary techniques: the lecture, the interview, and the drama. The chapter on exhibits is largely drawn from the presentations made by the American Medical Association at medical and other meetings. The essentials in the preparation of pamphlets and printed matter in general are excellently presented. Helpful advice is given regarding the material for newspapers. Of special interest are the chapters on motion pictures, including film sources, and the preparation and use of stere-

opticon slides. If the chapter on stereopticon slides could be brought to the attention of university teachers as well as those presenting material to the public, stereopticon slides would be of distinctly greater value. Everyone is familiar with the failure of the average lantern-slide presentation of data.

The subjects of magazine articles, correspondence and books are included in the discussion. In closing the book, the authors stress that health education techniques must not be regarded as separate factors but all must be correlated to provide an effective program. To this end, suggestions are made concerning the health education program for each month of the year.

Excellent use will be made of this book by all interested in health education.

*R. D. Defries*

**Mortality Trends in the State of Minnesota.** *Calvin F. Schmid, Asst. Prof. of Sociology, University of Minnesota. University of Minnesota Press, Minneapolis, 1937. 325 pages. \$3.50.*

THIS monograph presents a survey of the trends in mortality in the state of Minnesota. It is the outcome of a study made possible by a special grant of the University of Minnesota Social Science Research Committee, from the research funds of the graduate school. In compact form the essential statistical information of mortality in the state is brought together, and while no attempt has been made to more than briefly discuss each subject, it will undoubtedly serve effectively as a means of orienting the medical profession and administrative, public health, and social workers, in regard to public health problems.

It would be valuable to have such a document as this prepared for each province or state. It undoubtedly serves a definitely useful purpose but its real value lies in indicating the need for detailed analysis of each subject touched upon. The information which is presented may easily be understood by those unfamiliar with technical statistical analyses.

*A. Hardisty Sellers*



## CURRENT HEALTH LITERATURE

### **The Increase of Smallpox in the United States**

ATTENTION is drawn in this article to the smallpox situation in the United States where a steady rise in the number of cases over the past few years has occurred. In 1937, 11,806 cases were reported as against 7,844 in 1936. Though the disease at present is still of the mild type with few deaths, there is cause for concern. Peculiarly, the disease is largely confined to the least populous areas, the Northwestern States having a case rate of 428 per 1,000,000 population as against 1 per 1,000,000 population in the North Atlantic States where the density of population is 30 times as great. This disparity is accounted for by differences in past experience with smallpox and the extent to which vaccination is employed.

Statistical Bulletin, Metropolitan Life Insurance Co., vol. 19, no. 5, May, 1938.

### **A Study of a Type I Pneumococcus Epidemic at the State Hospital at Worcester, Mass.**

In January 1937, an extensive outbreak of epidemic (virus) influenza occurred at the main hospital which housed 1,800 patients and 500 employees. A second unit, 3 miles distant and housing 600 patients and 100 employees, escaped entirely. Lobar pneumonia, Type I, commenced at the same time and increased as the influenza increased and continued unabated after the decline of the influenza epidemic. A survey showed 10 per cent. of the patients to be carriers of Type I pneumococcus as was expected from the character of the epidemic. Since it was impossible to isolate this number of carriers an attempt was made to immunize the hospital population by administration of 0.5 cc. of Type I soluble antigenic substance (Felton antigen). No ill effects were produced and the epidemic ceased abruptly. Only one person receiving the antigen

subsequently developed Type I pneumonia.

Lobar pneumonia appeared in the second division of the hospital a week after the epidemic in the main hospital had ceased and was evidently due to the transfer of a patient who was a carrier. After 6 cases had occurred the remainder of the patients and staff were immunized and the outbreak ceased except for one further case, who therefore represents a failure of the antigen. The manner in which this outbreak ceased after the administration of the antigen, while not conclusive, was felt to be significant.

W. J. Smillie, G. H. Warnock and Harold J. White, *Am. J. Pub. Health*, 1938, 28: 293.

### **The Efficiency of Disinfectants in Tuberculous Sputa**

DISINFECTION of sputum from cases of pulmonary tuberculosis, an important routine matter, presents a particular problem in view of the nature of the tubercle bacillus itself and the protective action of the sputum. This article presents the comparative merits in this respect of a number of disinfectants: a solution of sodium hypochlorite, lysol, and three proprietary preparations designated, D, Za, and Ze. These were tested in two strengths, 2½ per cent. and 5 per cent., for intervals of ½, 1, and 4 hours on centrifuged, concentrated sputum. Lowenstein-Jensen medium was used for testing for viable tubercle bacilli, observations being continued for 40 days. No growth was obtained from sputum treated for ½ hour with 2½ per cent. lysol, 1 hour with 2½ per cent. Za, 4 hours with 2½ per cent. chlorine solution; while with D and Ze growth appeared in all cases. Such results illustrate in striking fashion the advisability of testing reagents under definite conditions rather than blindly accepting claims that are made for them, especially by their sponsors.

Alfred Adams, *Tubercle*, 1938, 19: 208.



